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SPECIAL ARTIFICIAL INCUBATION ISSUE.

February 1913

# THE ILLUSTRATED POULTRY RECORD

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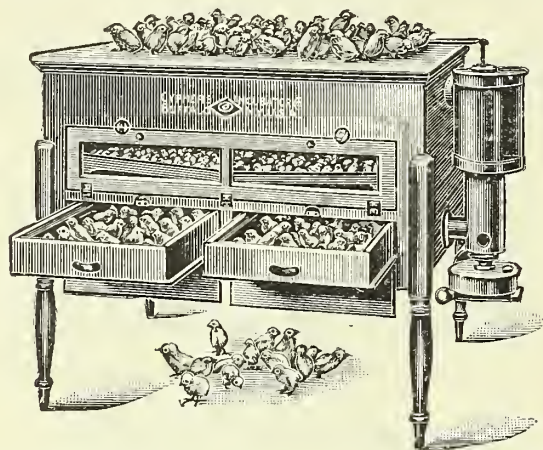
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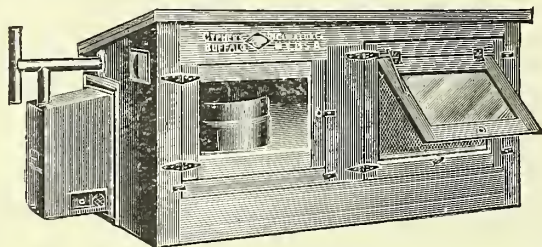
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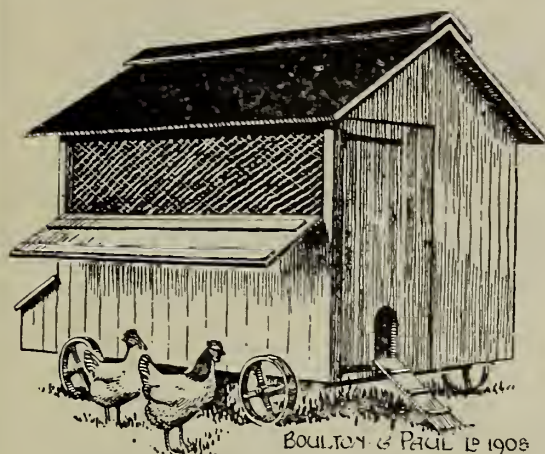
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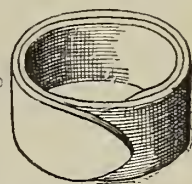
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The expert experience of the Editor will be given free to all sending enquiries, on treatment and method in connection with Poultry Keeping. Free by Post. Specimen copy of "Chicken Chat" on application to W. Holmes Hunt.



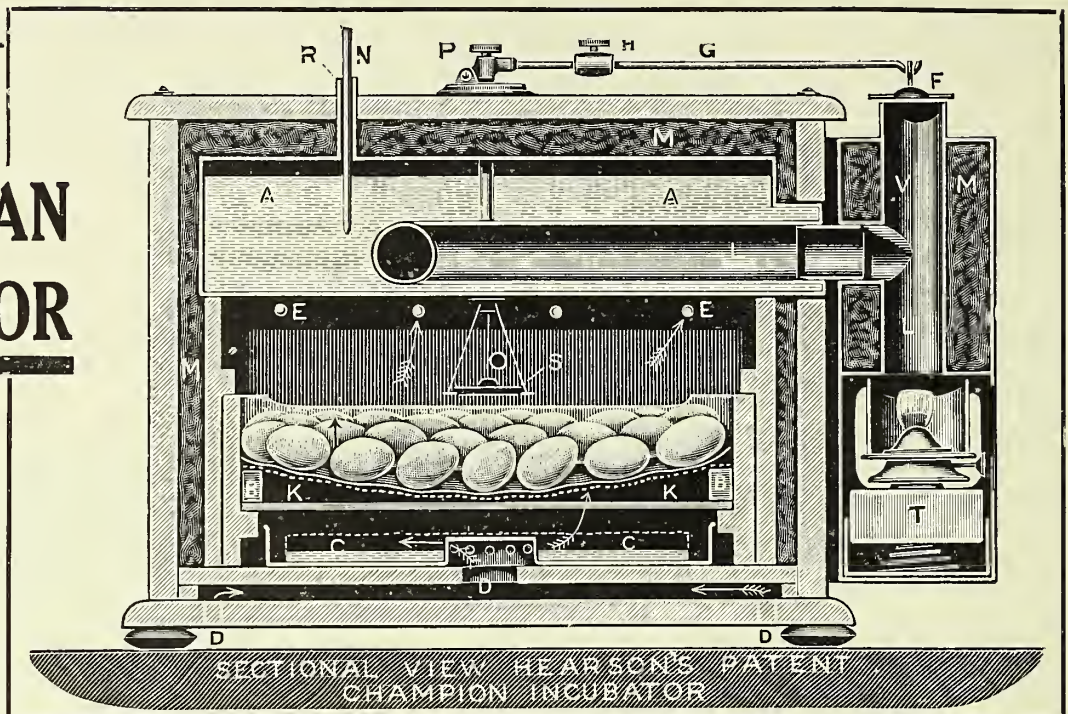
## BUYING AN INCUBATOR

### Our Advice To You

when buying an incubator is to obtain, from those who know, every shred of information respecting the merits and de-merits of every incubator you have in your mind. It is the only way to safeguard your own interests.

¶ Every manufacturer claims to have the best, but as all hot-water incubators are imitations of the "HEARSON," such statements should be accepted with reserve until you yourself have verified them. You cannot afford to experiment, therefore we again say INVESTIGATE!

¶ Inquire of your friends, write to reputable Journals, Fanciers or Poultry Farmers, for their opinions, and be guided by the EXPERIENCE OF OTHERS, always bearing in mind that the essentials of an effective incubator are PERFECT UNIFORMITY in Temperature, Humidity and Ventilation, and Durability.—



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¶ REMEMBER, your outlay is substantial, therefore follow our advice and INVESTIGATE BEFORE PLEDGING YOURSELF.

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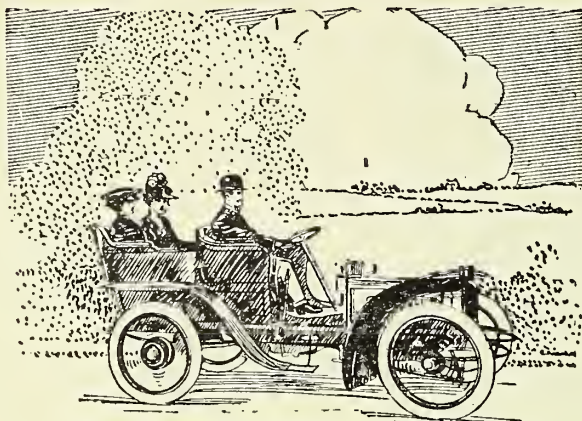
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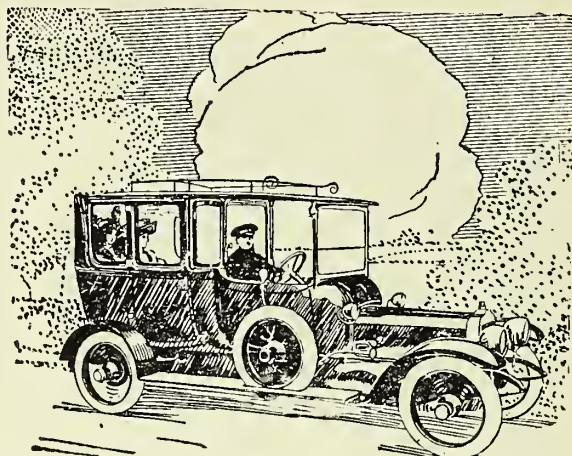
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*From an early catalogue.*

1904.



1913.

## “Talbots Never Stand Still.

In their designs, equally as in competitions, they are always striving to go one better, with the result that the list of improvements that have been made during the past year is quite a formidable one.

*Illustrated London News.*

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Automobile Designers and Engineers,  
Barlby Road, Ladbroke Grove, London, W.



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The Property of R. L. Mond.

This farm contains some of the leading winners in Orpingtons for the year 1912. It includes the Champion Buff Cockerel bought from Mr. W. J. Golding at a big price, also the Champion Buff Pullet, and several other winning Buffs.

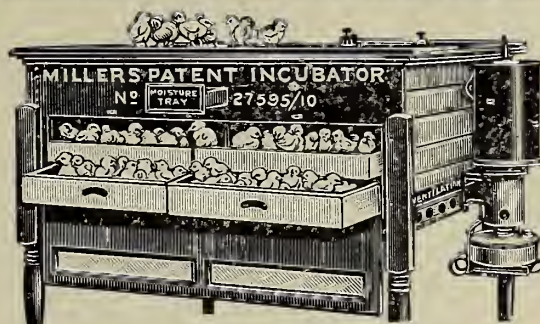
The White Orpingtons also have done their share of winning, and also the Black Orpingtons.

Orpingtons are not alone, as the farm contains Sussex and Faverolles, Yokohamas, Modern Game Pile Bantams, Modern Game Black Red Bantams, Modern Game Birchen Bantams.

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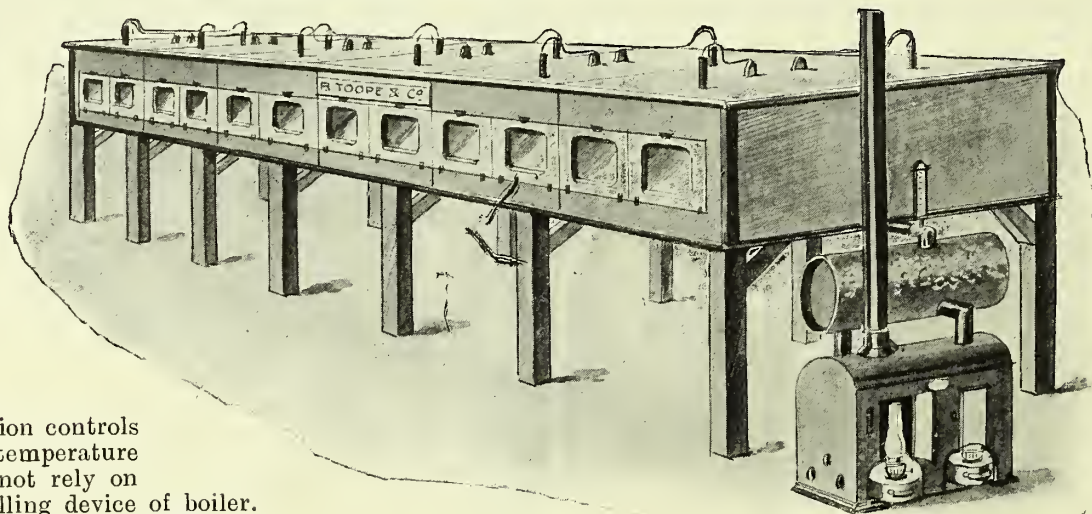
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*J.O. Schiffer 1908*

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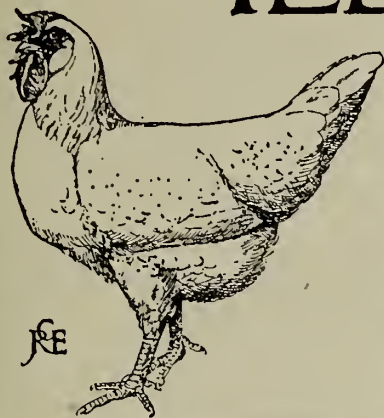
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**A TRIO OF SILVER BEARDED POLISH FOWLS.**

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# THE ILLUSTRATED POULTRY RECORD



Vol. V.—No. 5.

February 1, 1913.

Monthly, Price Sixpence.

## DIARY OF THE MONTH.

### EDITORIAL NOTICES.

Telegrams : "VIVACIDAD, FLEET, LONDON."

Telephone : CITY, 2083

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*The Editor would like to hear from readers on any Poultry Topics, and all Queries addressed to the paper will be answered by experts in the several departments. The desire is to help those who are in difficulty regarding the management of their poultry, and accordingly no charge for answering such queries is made.*

*The Annual subscription to the ILLUSTRATED POULTRY RECORD at home and abroad is 8s., including postage, except to Canada, in which case it is 7s. Cheques and P.O.O.'s should be made payable to the ILLUSTRATED POULTRY RECORD.*

**The ILLUSTRATED POULTRY RECORD is published on the first of every month. Should readers experience any difficulty in securing their copies promptly they are requested to communicate immediately with the Editor.**

**The latest date for receiving advertisements is the 20th of the month preceding date of issue.**

**The utmost care is exercised to exclude all advertisements of a doubtful character. If any reader has substantial grounds for complaint against an advertiser he is requested to communicate at once with the Editor,**

### The Era of Artificial Incubation.

When once we have become accustomed to anything it is difficult to realise how previously we existed without it. In these days there is much that our forebears never thought of which seems necessary almost to our existence. Telephones, and motor cars, and electric trams, to mention only a few accessories to our modern civilisation, have become indispensable to our every-day life. The same is true in respect to incubators. As shown in our present issue, devoted to this subject, it is only within the last thirty years that incubators became practically available for the poultry-keeper, that is within the memory of a fair proportion of our readers.

Prior to that time the few used were even rarer than aeroplanes are now, and they had about the same relation to production as the last named have to actual transit. Many can remember how that anyone who was progressive enough to buy a hatching machine was looked upon as a wasteful lunatic by the great majority of people, and the curiosity awakened was great in the extreme. When he failed to hatch chickens the wiseacres shook their heads knowingly, and he was the object of chaff and laughter. When he succeeded they prophesied that the chickens would be useless for any purpose. It was even suggested that a machine bred bird could never be a breeder.

All that, however, has passed. The stern logic of fact has proved that these non-natural methods are invaluable, and within the compass of everyone, large or small poultry-keeper as the case may be. When we learn that one maker claims to have sold 400,000 incubators, and when we find them everywhere, even the most sceptical have to recognise the real position of affairs.



### What will yet be.

If it were possible to imagine the condition of the poultry industry, were all incubators suddenly taken out of use or destroyed, we should be better able to understand how greatly they have contributed to its successful development. It might have been that had breeders set themselves to produce enough hens to undertake the work of hatching and rearing, to the extent now undertaken by incubators and brooders, they could have succeeded. In the doing so, however, the lines along which the industry has proceeded could not have been the same, and, probably, the races of poultry attaining greater prominence would have been different. Moreover, by making the breeder independent of the vagaries of hens, he has been enabled greatly to extend the season of hatching, and thus meet market requirements in a way which otherwise would be difficult in the extreme. From almost every aspect of the question the gain has been very great indeed. In fact, without artificial methods we should be far behind what is now the position.

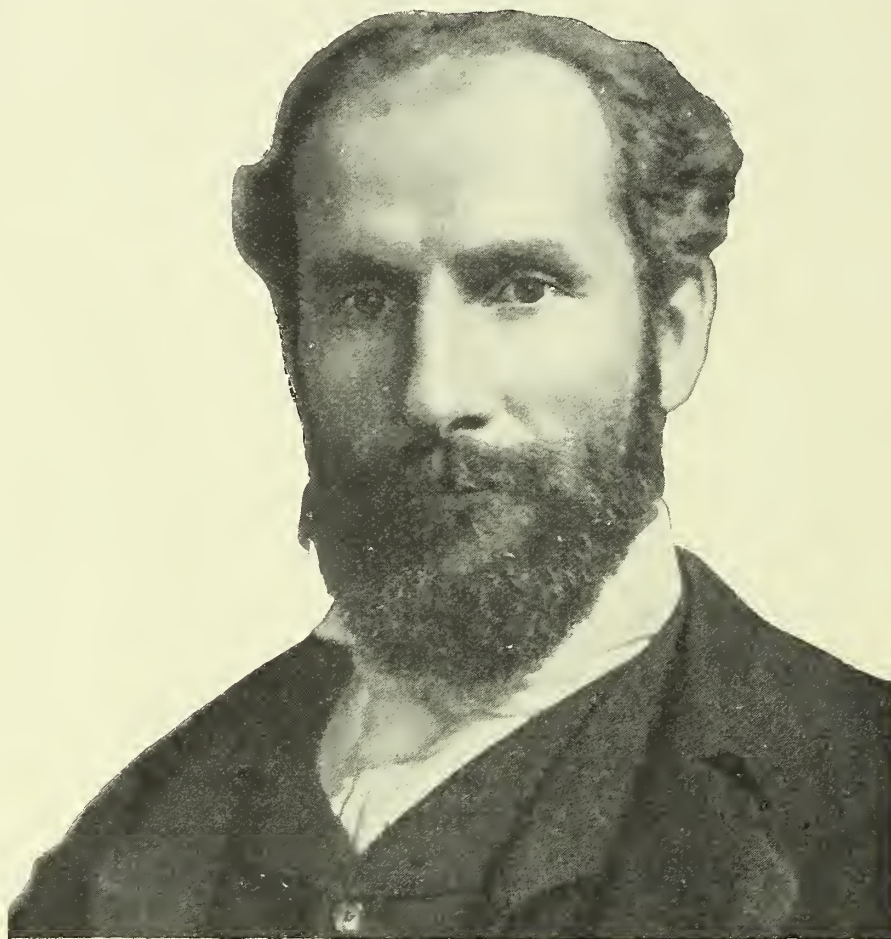
While acknowledging this much it must not be thought there is nothing more to be done. Our own feeling is that much remains to be accomplished. The effect of continued use of artificial methods has begun to declare itself, and that is not to the good. How far this may be overcome by a better knowledge of essential principles and their application, or whether we shall have to recognise that there is something lost as compared with natural processes, and therefore, to realise that there are limitations, remains to be seen. One thing, however, is evident, namely, that we cannot profitably dispense with artificial incubation, and that it must

extend with the industry as a whole.

### Sir Sydney Olivier.

To vary an old saying, "Ministers may come and Ministers may go, but the Permanent Secretary goes on (almost) for ever." Therefore, the appointment of successor to Sir Thomas H. Elliott, K.C.B., whose retirement from the Board of Agriculture and Fisheries was noted in our last issue, awakened great interest before Sir Sydney Olivier was designated for that position, and since, many criticisms have been made by reason of the fact that he has heretofore had no

connection with agriculture, and that he holds views upon social questions which are regarded as extreme. As to the former, it is probably desirable that the chief official of the Board shall be a highly qualified civil servant under whom shall be experts in the various departments within his administration, so that he may have no bias or special predilections in any direction. And as to the latter, political views should be no bar to opportunity for national service. Of all that has been said it cannot be questioned that



*Photo by]*

**SIR SYDNEY OLIVIER.**

*[Elliot & Fry.*

**The new Permanent Secretary to the Board of Agriculture.**

the new Secretary is a man of great ability, and it is satisfactory to note that the office is deemed to demand such an one. He has held several important positions at the Colonial Office, and for the last five years has been Governor of Jamaica, wherein he has made a notable success.

The future of the Board under him cannot be foretold. Time alone can prove what this appointment involves. Sir Sydney Olivier comes to it with vast opportunities, at a time when new problems are awaiting solution. We hope that his advent may be in the fullest degree successful, equally for agriculture at large and for each and all of the branches of which it is composed. While we cannot expect greater sympathy with



the poultry industry than was shown by the late Secretary, we hope that this may adequately share in whatever steps are taken for development in the days to come. Hitherto the Board of Agriculture has been unable to do as much as was desired. That is no longer the case. Those who have wrought so hard and long to bring the poultry industry to its present position are justified in looking for that fuller support now possible.

#### Egg and Poultry Auction Marts.

Attention is called in the *Journal of the National Poultry Organisation Society* to the Co-operative Auction Marts in Holland for the sale of eggs and poultry, promoted by the Netherlands Poultry Organisation Society, which we commend to the careful consideration of those concerned in the marketing of eggs and poultry. The Society referred to, with its hundreds of local societies and a total of 20,000 members, has done much for the advancement of the poultry industry in that country. All members have the right to send their supplies to these auctions, some of which are in the consuming centres, where they get into as close touch with the final destination as possible. We have in this country several auctions, the result of private enterprise and one co-operative, some of which are very successful, and by bringing buyers together have secured for producers better prices than were obtainable in the ordinary markets. So far as we are aware the distinctive difference between these and the Dutch sales are, that at the former the eggs are sold as received, whereas in Holland these are carefully tested and such as prove to be of standard quality are branded with the Society's trade mark, which is the guarantee. That is a very important difference. It may be that the ultimate solution of the marketing problem, which is a very great one, will be in adoption of a similar system all over the country. At any rate the question is worthy of consideration by those concerned, and the information given will be helpful.

#### Teaching Co-operation.

That the true principles underlying all co-operative effort are imperfectly understood is evident, and such knowledge as has up to the present permeated the British mind is very partial. While we should regard it as a serious menace to the national welfare if all manufacturing, commerce and trade were cut to a hard and fast point, or modelled on the same system, the value of co-operation as a competitive influence is of the greatest value. Individual action, effort and enterprise are essential to progress. In fact, production must be mainly individualistic. For instance in poultry-keeping

no co-operative poultry farm has ever succeeded, and we question whether one ever will. On the other hand co-operation as applied to marketing is and may be helpful and profitable. We are led to these remarks by seeing that the University of Wisconsin, U.S.A., has appointed a professor to teach the history of co-operation in all its branches as applied to agriculture and trading. This is a valuable and praiseworthy step, as students are given the instruction when their minds are most easily influenced. It would be an excellent arrangement if a regular and systematic course of lectures on this subject formed part of the instruction at all agricultural colleges and farm institutes.

#### Strong Hints to Hunts.

Gradually, as our columns have previously shown, the risks of the present position in respect to the fox question are forcing themselves on the minds of fair minded people, devotees of hunting and otherwise. A writer in the *Estate Magazine*, after calling attention to the value of the poultry industry, says: "To the people concerned these (figures) are of great importance, and it were well that hunt committees in dealing with the 'poultry nuisance,' as they are apt to call it, should bear them in mind. No one realises more honestly than the writer the importance of hunting to the country, and therefore no one feels more strongly that if diplomacy be used ways and means could be found—such, at least, as those suggested—of getting over the difficulty with less cost to the hunts than the present rather foolish *laissez faire* method of procedure incurs." This is sound, common sense, which, unfortunately, has not characterised those hunts and hunters who are responsible for the present condition of affairs.

#### Breeding Stations.

It is a well-known fact that the development of the poultry industry in several countries, notably Denmark and Ireland, has been greatly accelerated by means of breeding stations, from which a higher grade of fowl is disseminated, usually by the distribution of eggs for hatching to farmers and others. That in this way there has been a very great improvement in the class of fowl kept may be accepted without question. This method has been adopted in the more remote districts of Scotland, and is now, under the new Board of Agriculture, being rapidly extended. There are those who advocate adoption of the same system over the entire kingdom, and it may be that the English agricultural authorities have some similar project in view. In order to make these stations serve the purpose they have to be subsidised from public funds, as the eggs sent out are sold at



prices much below what would be economically profitable. Where the purchasers are poor and unable to pay something like reasonable rates, the policy here indicated is fully justified as a means of adding to the national welfare, otherwise improvement under these circumstances would be very slow indeed. When, however, that is not the case, it is not only a misuse and needless expenditure of public funds, but it has the effect of crushing out of existence poultry breeders who cannot compete with subsidised breeding stations. Such is the effect in Germany, and that cannot fail to be disastrous to the industry at large. We hope, therefore, that there will be no attempt made to "spoon-feed" in this way those sections of Great Britain where farmers and others are well able to afford a reasonable price for either stock birds or eggs for hatching. As the progress made up to the present time has been greatly helped by the work of individual breeders, unaided by public authorities, they have a right to demand that their trade shall not be killed by competition, to the cost of which they have to contribute.

#### A Sharp Lesson.

From one point of view the Christmas markets proved most disastrous. Not that producers suffered to any serious extent except in the few instances where they were late in forwarding their supplies. In fact, as a rule growers of turkeys and other winter poultry came off well, though prices were not as abnormal as in recent years, for the reason that the day of the big turkey at fancy values seems to be past. Other than these prices up to a given point were well maintained. Those who have lost heavily are mainly traders in the great centres of population. The causes are many and various, some of which are dealt with on another page. We fear the Press is partly to blame. Anticipatory notices heralded a period of shortage and high prices. Hence merchants were tempted to hold their stocks, unloading when altogether too late. This, combined with the miserable weather immediately prior to Christmas and a mid-week holiday, means that heavy losses have been incurred. This need not, however, deter producers, although it means we shall soon have to extend the season of consumption and not concentrate on the Christmas period. Perhaps the lesson was needed.

#### Credit Banks and the Poultry Industry.

Mr. Walter Runciman's announcement of the institution of a system of agricultural credit banks may have far-reaching effects on our industry, for the provision of ready capital to

the small farmer is a first step towards a great development in industrial poultry-keeping. On another page Mr. R. T. Lang deals at some length with the possibilities of a new departure. Mr. Lang has been closely associated with the movement for the introduction of credit banks; he has studied their operation in other countries, and as the Parliamentary candidate for a great agricultural constituency has made the subject largely his own. We may go as far as to say that his influence and perseverance on this topic has had no little to do with the adoption of the credit bank system by the Government, and in his close acquaintance with agriculture in Kent he has been brought into touch with the need for the adoption in this country of a system which has been so fruitful of good to the Continental agriculturist. To the poultry-keeper the latest development opens a brilliant future, for it means that he need not be forced to that most devastating of necessities, forced sales. With sufficient capital behind him he can afford to wait for a favourable market, and the development of the poultry industry amongst the smallholders is likely to be greatly assisted by the departure. A year or two will probably be needed to settle down to the new system, for the great stumbling-block will probably be the realisation of the advantages of mutual credit. Hereditary distrust of one's neighbour must be exterminated, but gradually experience will tell and we look to the growth of the credit bank system as a great lever towards that development of our poultry industry which will enable us to become a self-supporting and self-feeding nation, so far as poultry and its products is concerned.

#### Egg Train in North Wales.

We are glad to learn that arrangements are being made for an Egg and Poultry Demonstration train which will visit North Wales in April next, on similar lines to the pioneer expedition in South Wales in 1910. The experience then gained will be valuable in enabling this to be conducted on even better lines, and we understand that the scope will be considerably extended. The districts to be served will embrace the London and North Western and Cambrian railways, and it is expected that upwards of twenty centres will be visited. The details are not as yet completed, but will be announced in due course. The most satisfactory feature is that, we understand, this is to be the first of several such expeditions, as it is intended, as far as possible, systematically to organise educational and propagandist work in this way, as the results of the South Wales train have shown it is one of the most valuable methods that can be adopted.



## THE INCUBATOR.

What it has been, What it is, and What it may be.

BY EDWARD BROWN, F.L.S.



**W**HENEVER the history of artificial incubation comes to be written, it will be more fully realised than is now the case that the non-natural way of hatching is by no means so modern as is generally supposed. The Chinese and Egyptians, and probably other Eastern nations, have practiced the system for hundreds of years, and appear still to continue the same methods as their more or less remote ancestors. So far as Western European nations are concerned, the story is really comprised within two generations, that is, so far as there were any evidences of practical application.

### THE BOYLE MACHINE.

I never saw the "Cantelo" incubator which was exhibited at the first great exhibition held in Hyde Park in 1851. At that time my infantile attention was absorbed in other directions. That apparatus, however, attracted a large amount of attention, and to it may be credited the birth of an idea that the artificial might be supplemental to if not a substitute for the natural.

My first incubator was worked in 1876, that known as the "Boyle," invented by an artist living at Ellerhow, Ambleside, to whom I paid a visit in the summer of that year. An interesting incident occurred during my inquiry into the poultry industry of Germany. Going to see the British Consul General at Berlin, I found that he was a son of the Ambleside artist, and that he remembered his father referring to my visit. We had an enjoyable time recalling those distant days.

This machine was remarkable in many ways. It was beautifully made, scientifically designed so far as was then known, gave abundance of fresh air to the eggs, regulated very well, and was very expensive—a machine holding, I think, two dozen eggs—costing £25. It was very intricate, and the eggs, laid in a perforated tray, were slid under copper arches, which they almost touched, so that breakages were frequent and annoying. But it hatched admirably, that is, such eggs as escaped the arches. Its cost was prohibitive. Hence it was foredoomed to failure.

How many attempts were made to design a simpler machine cannot be told. Over my own experiments in that direction it is better to draw a veil.

### THE PENMAN INCUBATOR.

About two years later a machine was brought

out by a man living in Newcastle-on-Tyne, with which I had some concern. This was frankly based on the Cantelo model, but smaller in size and capacity. The great feature of these two machines was that the eggs received applied heat by actual contact, thus copying nature, instead of by radiation or diffusion as is now general. Above the trays was a large sheet of india-rubber, which rested upon the eggs, over which flowed the heated water. In the production of strong, hardy, virile chickens I have never known this machine to be surpassed. Here again was disappointment. In any case, as soon as the eggs were chipped, there was no easement of the pressure above, as would be the case with a hen, and the shells were crushed, especially after the rubber had been in use for some time and had begun to sag. Perhaps this might have been overcome, but that and an unsatisfactory regulator were fatal to it. It may be that owing to experience with this machine I have always felt and still am of the opinion that physical contact may be the ultimate solution of artificial methods of hatching. It is certainly nearer to nature.

### THE HYDRO-INCUBATOR.

About the same time, that is at the great Paris Exhibition of 1878, complexity and elaboration went by the board, for there was displayed a simple machine, the invention of M. Ronillier, for many years chief of the French School of aviculture at Gambais, who can claim priority in providing a practical machine on economic lines. It had no lamp and no regulator. The heat was maintained by replacement of a portion of the water in a large tank above the egg drawer by a similar quantity of boiling water. A copy of this incubator was sold in England by Mr. Thos. Christy. Variations of temperature were considerable, but these did not appear to make any difference within several degrees. Certainly the results in number and strength of chicken hatched were remarkable, and it had the recommendation of being inexpensive. The labour of supplying the needed hot water, two or three gallons, every twelve hours, exactly at the right time, was considerable. Hence the demand for lamps, which meant regulators. It, however, indicated an enormous advance, creating a demand which was ultimately met.

### THE HEARSON.

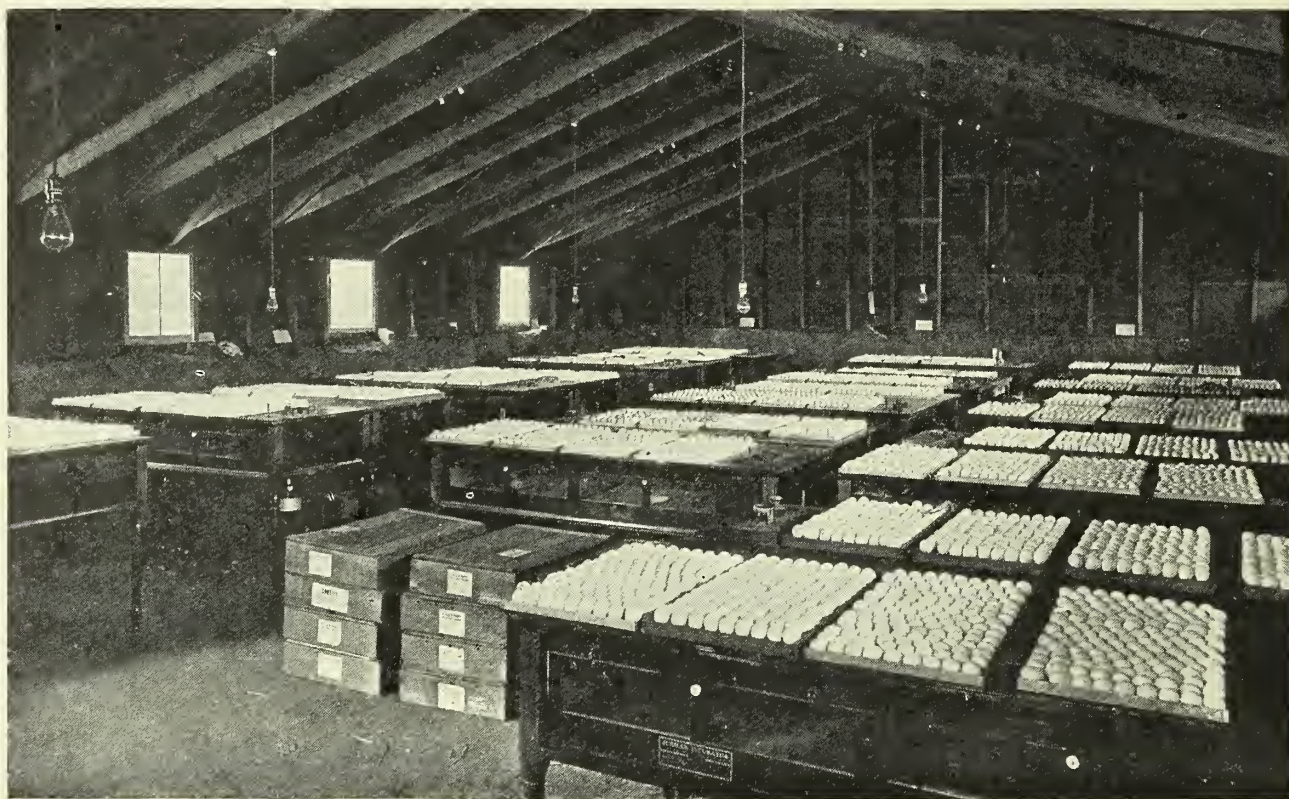
Meanwhile other minds were at work, among which was that of Mr. Chas. Hearson, who in the early eighties brought out his famous



"Champion," which to-day still holds the premier position among smaller machines. Many other makes are frankly based upon the same principles of regulation, heating, ventilation, and supply of moisture. From that time onwards we were in a position to say that artificial incubation was a practical and commercial success. How far it has contributed to the development of the poultry industry during the last twenty years can never be gauged. My own opinion has always been that the placing of the Hearson on the market was the commencement of a new era in this pursuit. Whatever the future may have in store, however great may be future developments, whether other principles may be adopted, the fact just named will be fully recognised. What

facture of incubators and brooders. One of these in America claims to have sold as many as 40,000 machines in a single year. Our makers cannot quote such figures as these, but reports received are to the effect that there is a steady and even rapid growth in sales, which, when we take into account the number of firms engaged in their manufacture, means that there must be a corresponding increase of purchasers, otherwise they could not all go on.

What is of considerable moment in this connexion is the effect upon the poultry industry at large. Had it not been for the fact that incubators of a practical character were obtainable, the progress made would have been impossible, except by an abnormal increase in



**A View of one of the largest incubator cellars in the World.**

*[Copyright.]*

must be evident, however, is that whilst other types of incubators have been introduced or modifications adopted, the principles upon which the Hearson was originally and is still built are the nearest yet discovered of artificial to the natural processes.

#### GROWTH OF USAGE.

At first there was great hesitation as to the use of incubators, which was scarcely to be wondered at. Steadily their value began to be appreciated, slowly at the outset, then as years went on with increasing momentum. That is true in every part of the world. One of the first things I saw when visiting the Czar's farm at Peterhof, in Russia, was a Hearson incubator. Great businesses have been built up for the manu-

the number of fowls kept of sitting breeds. When it is remembered that a thousand 100-egg incubators, allowing fair hatches per season, can do the work of, say, thirty-three thousand hens, it will be evident that advance has been possible to a degree that could not otherwise have been the case, and that growth of numbers of hens on that score was not of the same pressing importance. Only those who have been able to watch developments can have any conception of the change which has thus been brought about within a comparatively few years.

#### PRESENT POSITION.

The most ardent advocate of artificial methods of hatching cannot but acknowledge that there is something yet to learn, or, rather that



incubators are second best, and hens stand first. Only one instance need be mentioned, the higher evaporation in an incubator egg than when under a hen, the cause and effect of which are not understood. It may be accepted that the latter is the normal and, therefore, the better. Upon this and other lines investigations are in progress which may solve the problem. Most serious of all is the fact that death in shell and mortality in chickens are higher, in some instances enormously so, when incubator hatched, as compared with the natural method. Unless and until knowledge is increased and these difficulties removed, it cannot be claimed that the system has attained a satisfactory position. That such deficiencies are more marked with the use of certain classes of machines I am confident, as I am also that the more intensive the methods of breeding, housing, and management, the greater the risks in this way.

Investigations are now being made into these and many other questions, but it cannot be said that they have taken us very far. In some cases I cannot but feel that there is neglect during the pre-embryonic stage, and that the condition of the breeding stock has a powerful influence. When, however, we are faced by the fact that the results from eggs laid by the same hens differ so greatly in favour of natural methods, the causes must be looked for in the hatching stage.

As an instance of observations made, I quote from a paper by Professor James Dryden, of Oregon, one of the most capable experimenters in America, who says—

First—That there is more carbon dioxide under sitting hens than in incubators.

Second—That carbon dioxide with moisture decomposes the shell.

Third—That lime disappears from the shell during incubation.

Fourth—That the chick when it emerges from the shell, has more lime in its body than was originally in the contents of the egg.

Fifth—That the hen-hatched chick has more lime than the incubator chick.

Sixth—That supplying artificial carbon dioxide to incubators apparently injures the hatch.

Many observations could be made on the points here raised. It will suffice, however, merely to leave the question with these statements for the present. One fact is evident, namely, that what we have to guard against is not only the immediate effects of any system but the accumulated influences over a series of years. Hence it is that some of these results were not at first apparent.

#### FUTURE DEVELOPMENTS.

We have now reached a stage in the progression of artificial hatching when fresh problems are presenting themselves for solution. The period for more or less general adoption of the system has passed, although it is undoubtedly

true that there are vast numbers of farmers and other poultry keepers who have yet to be brought into line, and who as yet have not used an incubator. There is abundance of scope for advance in that direction. My own view is that these machines are more valuable to, and will be more successful in the hands of farmers who keep their fowls under better conditions than is possible to the specialist or the intensive poultryman. Therefore, I anticipate that demand will largely grow on the part of agriculturalist poultry-keepers in this and other countries.

What appears evident, however, is that in the near future there will be a great increase in the number of large hatching plants, either for the supply of day old chicks or on establishments where a large number of chickens or ducklings are to be annually hatched and reared, whether as layers or for killing. Already we have several of these in being. Where that is so the question of capital, expenditure, and of labour in controlling apparatus arises. Taking such a plant with an egg capacity of 10,000, there would be required a hundred 100-egg, or fifty 200-egg machines, the equipment cost of which would be £300 to £500, according to the make of incubator employed. That is not all, however. To fill and trim the lamps of this number is a heavy task, as those who do it know full well. Hence the demand for what are called "Mammoth" Incubators, that is, heated from one source. In America there are several of these on the market, and statements are published that they are successful, one of which has recently been set up in England. Be that the case or not, I cannot doubt but that there will be great developments in this direction quite equal to others that have preceded. In some of the "Mammoth" machines referred to, these consist of a duplication of ordinary incubators heated from one stove, but each section separately regulated. In this respect these differ from the egg ovens of Egypt, each of which forms really one huge machine. I hear that one conforming to that principle is being tried in America, and differs totally from anything we have had before so far as the heating is concerned. How far it proves commercially successful remains to be seen.

#### LIMITATIONS.

Whatever may be the development of future days, however great progression may be made, it is necessary ever to keep in view the limitations inseparable from artificial methods. Unless that is done, as difficulties are overcome others will make their appearance, and, be it noted, the greater the adoption of a system the more powerful will these influences become. To ignore them is folly. Only by their recognition can we hope to discern the better way.



## THE ADVANTAGES OF ARTIFICIAL INCUBATION.

By J. W. HURST.

Although the practice of artificial incubation is of such extremely ancient origin, the general appreciation of its many advantages is of only quite recent date, and it is by no means too late to refer to some of the benefits of mechanical hatching contrivances in the interest of those who are as yet without practical experience. That the use of incubators has steadily increased, and this to a really remarkable extent during the past decade, cannot be gainsaid. There is plenty of evidence of this fact in the growth and multiplication of manufacturing concerns, the ramifications of whose business extend in all directions throughout the civilised world from both sides of the Atlantic. It may in fact be said with truth that one of the most substantial proofs of the growth and general progress of the poultry industry is to be found in the large and increasing output of artificial appliances, and the flourishing condition of the manufacturers' trade. Moreover, the prosperity of these traders supplies an argument relative to the more common realisation on the part of producers of the many advantages of artificial incubation.

However, much as practical operators have learnt to value the aid of the machine, and have indeed for some purposes come to regard it as indispensable, there are probably few—if any—who would claim perfection for even the most reliable makes. Hence it comes about—and the keenness of modern competition gives the impetus—that all reputable makers are constantly striving after improvements, and making such alterations as may tend to increase efficiency and add to utility. Nevertheless, although there are various modifications of design and arrangement, incubators are broadly divisible into two main types. These are colloquially referred to as hot air, and hot water (or tank) machines, according to the system of heating adopted and applied in the construction. Some prefer the one method and some the other, and personally I have had quite satisfactory results with both—running them side by side under equal conditions. Hitherto English users have been content with incubators of moderate egg capacity, but it must be noted as among the signs of the times that there are (within my knowledge) varieties of the big American type of incubator now in this country. Within the past few weeks I have seen a recently imported 3,000-egg machine in operation, and I know of others of considerably larger capacity—some so lately arrived that they have not yet been set up.

We know, of course, what our American friends tell us about their huge incubators, but it is perhaps a little soon to talk very definitely about the results attainable under English conditions. If the facts should justify the expectations of those who are responsible for their introduction on this side, it is fairly evident that they will make a strong appeal on the ground of greater economy of both fuel and labor. Be that as it may, we are in no doubt regarding the general advantages of artificial incubation, and we have a good workable knowledge of the types that have been commonly in use in the United Kingdom up to the present time.

The general advantages are probably more obvious in some particulars than in others. It will at once be recognised that the use of incubators very considerably enlarges the possibilities of production. That is a commonplace. But although the general scale of operations may be greatly increased by their aid, I am of opinion that they are, under present conditions, of greatest value to the greatest number when their use is supplemental rather than when they are adopted as substitutes for the natural mother. But it is possible that the course of events in this country may tend to greater centralisation, which must obviously depend upon artificial methods to a greater extent than hitherto. Greatly as I have in my time benefited from their use as adjuncts to the hen, I have never been of those who regard the machine as the superior medium of incubation. The saying of this is no aspersion, it is merely the assertion of an opinion that nature is more skilful than the most dexterous mechanician. Having claimed due recognition of the limitations of the human instrument I am the more ready to allow the advantages that ingenuity has placed at our disposal.

In any comparison of artificial and natural means of incubation, and their relative advantages and disadvantages, it must of course at once be admitted that the influences of domestication have introduced factors which make it necessary—in some particulars and in some circumstances more than others—to modify our estimation of the natural method. Not only have we non-sitting breeds, races in which the incubating instinct has been almost or entirely eradicated or destroyed, but individuals of sitting breeds have been differently affected by the conditions, and methods of management to which they have been subjected. There is consequently an element of unreliability with



which we have to reckon, as well as the further and important fact that climatic and other influences are largely operative in causing a scarcity of broody hens at seasons in which the exigencies of demand make incubation especially desirable. For the purposes of early marketing, and for production generally at seasons that are more or less unnatural for hatching in the ordinary way, the use of the incubator is imperative, as it is at other times where a large or constant output is required. Again, to give a particular instance of the utility of artificial incubation, the day-old chick business (which is among the recent developments of the industry)

It is clear, therefore, that the advantages of artificial incubation include the ability—other conditions being equal—to produce chicks at any time and practically in any number; that non-sitters may, when desirable, be kept as the only stock, without any disadvantage to the breeder consequent upon their non-incubating characteristic; that for mere hatching purposes the machine is the equivalent of the number of broody hens that would be required to sit upon the eggs it will hold, multiplied by the greater number of times it is available in a year or a season; that labour is lessened and more thoroughly systematised; and that some risks



**A well-arranged incubator room on an English poultry farm.**

*[Copyright*

would be practically impossible by adhesion to the natural method. It is moreover among the probabilities of the near future that new methods of poultry management will lead to a great increase of those who will see the advantage of purchasing young birds from those who specialise in their wholesale production, and such an increase in the division and sub-division of productive operations will serve to accentuate the advantages of artificial incubation in this connection.

are materially reduced, while the general balance is on the side of economy.

Apart from the more extensive use of mechanical methods by specialists who realise the advantages of artificial incubation for their purpose, the practical value of incubators as auxiliaries to sitting hens (and the distribution of the artificially hatched chickens among those naturally incubated—for rearing by hens) has long been, and is being to an increasing extent,



admitted by those who take the trouble to understand the operation of the machines. I have found that much of the prejudice of chicken rearing farmers has been due to a disinclination to devote the same intelligent attention to the working of incubators that is so readily given to reapers and binders, and the other intricate machinery used by modern agriculturists. The proportionate importance of poultry production may be small, but if it is undertaken upon any sort of commercial basis, it is uneconomical to ignore such valuable practical adjuncts at seasons when the natural disinclination to broodiness renders the output small. It has frequently been said that as a hen can more successfully rear a moderate than a large brood in the early months, it is foolish to add to her responsibilities by the addition of artificially incubated chickens, but I think there is less force in this argument than appears at first sight. It is a fact that under average conditions and management the fertility percentage of eggs is low in winter, and the average chick production falls far short of the

number set. More often than not a hen in winter rearing is wasting a considerable proportion of her brooding capacity—and this in a hen of normal proportions is usually greater than is commonly supposed—unless as often happens the chickens are bulked under half the original number of hens, when the mothering energy of the others is lost at a season when its value is greatest. Those who adhere to the natural method of rearing, and there are still very many practical producers who do so, will find it advantageous to use an incubator of a size proportionate to the average number of hens usually sitting at the time when its employment is most desirable. It is perhaps not too much to say that in the majority of cases of farm production there would seldom be any surplus chicks consequent upon the use of a 100-egg machine coincidentally with the sitting of ten or a dozen large broody hens. There are of course cases of exceptional management and a resultant higher hatching percentage in winter, but I am referring to the consequences of ordinary conditions.

## INCUBATORS AND THEIR MANAGEMENT.



ARTIFICIAL incubation, or hatching by incubators, is much to be preferred if one wishes to hatch early chickens, as owing to the hen not usually becoming broody until nearly spring, it is practically impossible to hatch any number of very early chicks under natural incubation. For the small poultry-keeper who wishes to hatch and rear a few birds every year, the hen will be found most useful, but if it is desired to hatch a large quantity, incubators are absolutely essential.

There are a great many different types of incubator now on the market, many of which are very high-class machines, and I strongly advise any purchaser to buy from reliable firms, who have their reputation to keep, rather than waste their money on a cheap and inferior article which will probably only last a year. Incubators of the present day are made on two different principles—viz., hot water and hot air—and having worked both kinds, I must honestly say that the results obtained from the best of each make are about equal. Some machines are easier to understand and work than others, and my own experience is that the hot air is the simpler of the two. When the hot-air incubator was first introduced a few years ago, a charge was made against it that it would not stand the variations of the English climate and keep a level temperature; but this has been proved false, and this type of machine has now reached such a high stage of perfection that not only will it hatch in any climate but will maintain an even temperature. In the tank machine

you have to use hot water, and it consequently takes longer for an incubator of this pattern to heat up than it does for the hot air.

Incubators may be run by oil, gas, or electricity, the most common, of course, being oil; but any machine can easily be fitted up for gas with a little tubing and a special burner. It is always wiser to run the machine a day or two before putting in your eggs, in order to make sure that the machine is running quite steady. The temperature of a hot-air incubator should, generally speaking, be 103 degrees, and that of a hot-water machine 104 degrees.

As with the hen, only the best shaped eggs should be set, and the fresher they are the better the result, although I have frequently obtained excellent hatches from eggs three weeks old. Be certain that your stock from which you are getting your eggs is quite healthy and vigorous, and remember that even the best incubator cannot hatch unfertile eggs, as many novices seem to expect. A good class machine will hatch out practically every fertile egg, and the chicks are quite as strong as those hatched under the hen. The best place to run an incubator is one in which you will get uniform temperature, and undoubtedly the finest is the cellar. Of course they may be worked in a living room or out-building, but care should be taken to keep out draughts and direct sunlight. On no account have the machine so placed that there will be any vibration. Endeavour to keep the temperature of your room about 60 degrees, and be sure that you have plenty of good



ventilation; this is a vital point in artificial incubation, owing to the air becoming devitalised by the fumes from the oil or gas. Chickens hatched under bad ventilation are never so strong.

As each maker sends out his own directions for working the incubator, I only propose to say a very few words as to the starting and general management.

Once the machine is set going, do not attempt to meddle with the lamp, but if you find that your temperature is too high or too low, heighten or lower your regulator accordingly. Always keep a nice level flame and do not allow the lamp to smoke. The lamp should be filled once daily with the very best paraffin oil obtainable, and the wick

twice a day and cooled once. The length of time the eggs are allowed to cool will to a great extent depend upon the egg themselves. They should be put back when the sensation of warmth has left them, but do not let them get stone cold. Start cooling with five or ten minutes and gradually increase to twenty and thirty the last week. In very hot weather or in a warm room they will take even longer.

As with the hen, eggs can be tested the fifth day, but it is advisable, unless you are an expert, to leave it until the seventh day, testing again on the fourteenth day, and removing any with dead germs. Unfertilized eggs may be eaten or sold to the confectioner. The reason of testing is that the live



#### A CHRISTMAS SCENE IN CAIRO.

Egyptian poultry-keepers driving a flock of geese to market.

[From a photograph by a No. 3 Folding Pocket Kodak.]

trimmed; the best time to do this is early evening. Have sufficient flame to keep the valve swinging free about the eighth of an inch. Too much care cannot be taken to keep the lamp and burner clean, and it is better to start each hatch with a new wick. In hot weather the wick may be clipped at the corners to reduce the size of the flame. Eggs for hatching should be kept in a room in a temperature of 50 degrees. There are many devices for turning eggs, but I believe Nature's way is still the best, and the nearest copy we have to Nature in a machine is that of turning or shuffling the eggs with the hand. Remember a sudden jar might easily kill the germ. Eggs should never be left standing on end in incubators. Most makers advise the eggs being left alone after the eighteenth day. The first week the eggs are generally cooled sufficiently in the turning. They should be turned

eggs do far better if the dead ones are taken away. A live germ shows a dark spot with blood veins radiating out, giving the appearance of a spider's web.

In order to obtain an equal distribution of heat use a spirit level when you are setting up your machine.

Chickens may be placed in brooders, which have been previously warmed, about twelve hours after hatching.

In conclusion, those who are about to take up artificial incubation need have no fear, as it is quite as easy to hatch young stock this way as it is with the broody hen; and I guarantee that the merest novice will obtain a good hatch the very first time, if he will only use a little common sense and follow the directions of the maker.



## AGRICULTURAL CREDIT BANKS.

Their Possibilities and their Uses.

By R. T. LANG, J.P.

WHEN Mr. Walter Runciman was appointed to the Presidency of the Board of Agriculture there were scoffers galore. "What can he know of agriculture?" said the pundits. How could he follow such an expert as Lord Carrington? Having had unique opportunities of observing Mr. Runciman's work I have no hesitation in declaring him the best President of the Board of Agriculture we have ever had. I say this with no detriment to Lord Carrington, whose splendid work for agriculture men of all political thought recognise. Lord Carrington laid the foundation. Mr. Runciman is building the structure.

His success is largely due to the fact that he looks at the agricultural question from a business point of view. We have heard much of late years of the need for a business government. Every man engaged in agriculture as a business will grant the need. Agriculture as a pastime or a hobby is interesting. But the real needs lie amongst those to whom it presents a means of livelihood. If we are to achieve really beneficial results we must approach every agricultural question from the point of view of the man who is in any branch of it for business.

The most epoch-making step in the agricultural career of the President was that declared on the afternoon of Tuesday, January 14th. It was in reply to an apparently simple

question by Mr. Hamersley that Mr. Runciman unfolded a scheme which means salvation to thousands of our small farmers—and particularly of that class amongst whom it is most desirable

to develop the poultry industry. The details have been already spread broadcast. I need not repeat them in full. I propose instead to deal with some of the more salient points.

I may premise, however, by saying that I happen to know that the whole scheme has the cordial approval of Lord Carrington. I can go further. It has the cordial approval of the leading bankers as a financial proposition.

Before dealing with Mr. Runciman's plans I would like to say a word on the need which has arisen for credit banks. My experience of rural life has shown me that there has come a great change over rural finance in recent years. The development of the joint-stock bank has been the cause. Thirty or forty years ago private banks were supreme. They were managed locally. The head of the bank knew all his customers personally. A customer who

wanted an advance could approach the head direct. If the agriculturist were a man of good repute he had little difficulty in obtaining an advance on what would be considered to-day intangible security. I know of one instance of an agriculturist who, at one time, was indebted to his bankers to the tune of £12,000 without a



**MR. R. T. LANG, J.P.**

Whose article on the Credit Bank System will be read with interest by all who are in touch with the various sides of the poultry industry.



penny of security. The banker knew his man and his business. To-day that man's cheque for £50,000 would be honoured in a moment. He built his fortune on the combination of his own credit and the bank's cash. The private banker would advance on growing crops.

The advent of the joint-stock banks has put an end to all this. Requests for advances have to be forwarded to headquarters. The Board (usually in London) knowing nothing of the private status of the proposed borrower, demands collateral security. That is a difficulty to the working farmer. If he cannot provide it, one of two things happens. Either he goes to a money-lender or an auctioneer. I don't know which is the worse of the two. The money-lender will bleed every penny out of him eventually. The auctioneer may or may not. I know some auctioneers who act splendidly by their men. I know instances where they serve as the private bankers. But there are others. Let me give one instance which came directly under my own eye.

A poultry-keeper in a large way found himself running short of cash. He was financially sound, but his money was locked up in stock. So he went to an auctioneer for an advance and got it readily. But the time came for repayment. The farmer could not repay without heavy sacrifices. His stock wasn't ready, so the auctioneer agreed to an extension of time provided the farmer would agree to a quantity of stock being put on his farm and fed free. It was a rate of interest far beyond the sixty-per cent. of the money-lender. This is not an isolated instance. I can give others following similar lines. While many auctioneers act nobly by their people—there are others. And the law, as it has stood, has been on the side of the others.

Mr. Runciman has followed the right lines in calling in the co-operation of the joint-stock banks. He proposes that we should have agricultural credit societies on the lines of those which have proved so successful in Normandy, Denmark and Russia. The fundamental feature of these credit societies is mutual credit. Every member is personally responsible for the debts of the whole society. I can hear it argued at once: why should I be responsible for my neighbour's debts? My friend, you need not be. You are not compelled to join one of these societies. But unless you are endowed with superabundant wealth you will find that it is to your advantage to enrol yourself.

The basic principle of such societies is that no man is admitted to membership unless he is known to be of good repute. Let us take any village community as an example. In that community are a number of farmers, stock-

breeders, poultry-keepers and agriculturists in general who are all known to one another. Probably amongst them are one or two black sheep. It is decided to form a credit society. The black sheep will be promptly excluded. Other men will not accept responsibility for them. But the men who have attained a decent reputation for paying their debts will band themselves together for mutual assistance and support. A small, confidential committee will be appointed. It must be a confidential committee. The man who desires to borrow money doesn't want everyone to know about it. The committee will consider the security offered. If it be on stock, say poultry, the committee as practical men will decide whether it offers a reasonable margin of security. Moreover, they will consider the reputation of the proposed borrower. Is he an honourable man? If he is, and the security is sound, then the society will jointly guarantee to the bank the advance which the bank is to make. When the stock is sold the committee, with its local knowledge, will see that the advance is repaid. Local knowledge is the keystone of it all.

The principle of joint liability is that which has worked so well in the friendly societies. In these, every member is personally liable for the whole debts of the society. But by means of careful management the personal liability is reduced to a minimum. Practically it is non-existent. So will it be in the agricultural credit societies.

The rate of interest must be low. With such a guarantee the banks can afford to advance at slightly over what we know as "bank rate." Think what it means to be able to borrow money for stock purposes at five per cent. per annum, instead of the money-lender's five per cent. per month. All advances must be sternly restricted to requirements in stock, cultivation, or buildings.

Non-members should be allowed to subscribe to the funds. There are many people in the country who would be willing to help by subscriptions of £100 and upwards. They could join us as non-members, receiving a small interest on the money they invest. But only full members should be eligible for loans.

One suggestion only have I to make. It is that the Government should assist in the formation of these societies (at any rate, in their early stages) by advances commensurate with the amount of members' subscriptions. The money of the Development Commissioners would be much better laid out in this direction than in building new roads for motorists. For all such money laid out is productive to the country. It encourages enterprise. It builds up the land industry



# THE SEVEN PHASES OF THE POULTRY INDUSTRY.

By WILFRID H. G. EWART.

## I.—ON THE FARM.

I HAVE set out on this review of the poultry industry in all its seven distinct phases with the case of the farmer, because when all is said and done he will prove the backbone of that industry. To him must we look for a liquidation of that debt to the foreigner of which we are so frequently reminded, and upon him must we depend for a criterion of the conditions of poultry-keeping in this country. We all know his shortcomings, his proverbial density and indifference, and to these I do not intend further to refer. Nor shall I attempt a too Utopian definition of his business or demand of him the sort of advance and culture which is so often (and irrelevantly) recommended. For farm poultry-keeping is not the easy thing many people imagine: it has its considerable difficulties, and those very difficulties encourage the lethargy which farmers feel towards their fowls.

### FIRST PRINCIPLES.

The first principle on which the farmer's fowls should be run is of course the colony system. That is the principle of decentralisation. Instead of being herded indistinguishably in the farmyard—overcrowded and completely miscellaneous as to size and breed—they are drafted out into the fields in flocks of not more than thirty-five at a time, there finding fresh ground and plentiful insect life. This, too, is the only principle upon which more than one pure breed can be satisfactorily kept, or upon which chickens may be graded to various sizes and so properly reared. But herein also lie the very difficulties I have adverted to. A large stock of fowls requires not only considerable sub-division but a good deal of shifting from one cause or another as well. Take the position of affairs, say, at this very time of year. The breeding lots—many of them—and the surplus cockerels should be out on pasture whilst the laying pullets are about the homestead. Nevertheless those breeding lots and cockerels cannot be situated more than half a mile from the farm, because of the trouble of reaching them to feed, water, and shut up or open. The chances are, therefore, that many old occupants of the farmyard—which fowls much prefer to other places—will find their way back to it and so far as I know there is no effectual preventative of this. Good feeding, and above all a hearty feed around the house at night will answer for a time, but

not if the birds know the way to a more sociable spot.

### COTTAGER CO-OPERATION.

To meet this difficulty—and it is the great difficulty of farm poultry-keeping—I have found the co-operation of cottagers to be a salutary measure. Further decentralise by extending the flocks to the boundaries of the farm land under the supervision of tenants or others. Give to each agent of this sort about twenty hens and two cocks, and make them responsible likewise for rearing a certain number of chickens. Supply the coops and the food, pay twopence or threepence for each bird reared, and both sides benefit by the transaction. Where opportunity offers I feel sure this extension of the colony system is an improvement upon it, for not only are the birds properly divided, but they enjoy the benefit of the freshest land.

### OPPORTUNITIES.

Should a big stock of poultry be maintained on the average farm? I put three hundred as the largest number which can be properly managed. And as to management, let one reliable man, assisted if possible by a boy, have charge of the poultry department, and give him an interest therein by means of commission on the number of eggs collected, or even a percentage upon the total annual profit. This may not be an applicable principle as regards the general scheme of farming, but it is so in the case of the poultry department, and a beneficial stimulus too. Rigorous supervision will, however, always be necessary, for the code of honour is not too nice among farm hands, and doubtless many thousands of eggs are lost to farmers every year by thieving. Only keep an intelligent record of egg returns, and make it worth a man's while to bring in all he can find, and you have dealt with that serious problem.

The opportunities of farm poultry-keeping are many. There are the numerous substantial old houses which only need demolishing and re-arranging inside in most cases to make warm and suitable buildings. There is the close-planted orchard with its southern slope, which seems so ideally suited to chicken-rearing. There are the barns in which space can always be found to accommodate coops and rearers in the off season. There are the outhouses and



even pigstyes, if not immediately required, which come in so handy for spare stock birds or fattening cockerels. Yes, there are many extraneous and palpable facilities on a farm.

#### THE GREAT SCORE.

But of course, the greatest thing about it all in these times is the cheapness of feeding. Take briefly the round of a poultry-keeping farmer's year. In January he has to feed his breeders

biscuit meal will of course have to be bought, but, as I contend, that is really the only poultry food which need be paid for the year through. Hay-time comes, and the young birds get out on the fields, finding a plenitude of insect life, while the old ones pick up rich fare nearer home. From late spring till early winter it is only the chickens which want feeding, and after mid-summer they can generally do without extra rations. There are thrashing days from time to



#### IN THE FARM-YARD ORCHARD.

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An orchard forms almost an ideal situation for poultry, since not only do the fowls obtain shelter and shade, but the trees derive great benefit from the manure.

well. Wheat-meal and pea-meal he can profitably grind in plenty in his own barn, sharps and barley-meal can be shared not uneconomically with the pigs, while in the granary there should be plenty of back end barley and sifted tail wheat with, by luck, a spare sack or two of seed oats. Thus at the most difficult time of year good feeding can be found, and made to last out too, right through the spring under ordinary economy. A little later on, in February and March, when the younger chickens are about, a certain amount of chick feed, fine oat-meal, or

time, when fare is almost too plentiful, and by eleven o'clock in the morning the whole farm-yard is gorged with the loose corn. Autumn comes with richer feeding than ever, and now the turkeys are out on the stubble with the fowls, all living free to the farmer. And always, mind you, the colony system properly worked and developed is at the back of it, else not half that economy in production would be possible.

#### SOME CONCLUSIONS.

I have begun my series of papers with the



farmer, not only because he is the most important phase of our industry, but because (I am convinced) he has at command the greatest profits to be extracted from it. Don't mistake me. I do not say but what the specialist poultry farmer, rearing his thousand odd chickens a year, will not make a larger sum in bulk: he will. But when time and cost, and outlay and labour, and numbers are considered, then I believe the ratio of income from farm poultry is very much higher. Looking into my account books for the past few years, I come to another conclusion. This is, that the general belief of poultry being proportionately the most profitable section of the general scheme is no theory, but a fact. Nobody who takes a businesslike interest in his

fowls, and regularly enters up his books, can doubt it.

I am not so sure about incubators and rearers and the artificial system—whether yet awhile they ought to be pushed into the hands of the agriculturalist. There are probably more important things—and the colony system is one of them. Disposal of produce is another, for the advantages of private trade are little thought of. Yet everywhere the large consumer is looking for fresh eggs and good table fowls, willing to pay a first-rate price for both. But somehow the countryman—being an unconscious Socialist—seems to prefer to share his slender profits with the middleman and the retailer.



**A TYPICAL FARM-YARD SCENE.**

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### A Useful Inquiry.

The proprietors of our contemporary, *Poultry Husbandry*, have offered what is called the Poultry Husbandry Fellowship in association with Cornell University, which is to be awarded to a student of that institution who shall undertake the investigation and presentation of the market condition existing in New York State cities of the fourth class during the next twelve months. The results of this inquiry cannot fail to be of the deepest interest.

### Poultry in Ontario.

The Crop Bulletin issued by the Ontario Department of Agriculture shows that the number of poultry in that province on July 1st, 1912, there were in the province 13,024,983 poultry of all kinds, of which  $11\frac{1}{2}$  millions were fowls. Each class of poultry showed a slight increase in numbers as compared with the previous year. It is recorded that in addition upwards of five and a half million poultry had been sold or killed during the previous twelve months, which was half a million over 1911.



## POULTRY PATHOLOGY.

## Its Place in the Curriculum. (\*)

By DR. GEO. BYRON MORSE, Biologist, Bureau of Animal Industry, Washington, U.S.A.



NE'S answer to a question depends upon the viewpoint. At a civil service examination, to the question "What does a perfectly equipped power house need?" a dubious but resourceful candidate answered, "Nothing." His viewpoint was different from that of the examiner. "What position shall the study of disease occupy in the poultry husbandry course?" is answered by the writer thus: "A, if not THE MOST PROMINENT PLACE."

Poultry husbandry should include three groups of studies: Zootechny, Economics and Hygiene. Although naming it third in the list I do not hesitate to affirm that in the most subtle manner poultry hygiene assumes first place in the operations of a poultryman.

Poultry zootechny is that branch of poultry husbandry that has for its object the study of alimentation and reproduction, or, to use an expression that means less and yet is truer to the actual condition of things, the practice of feeding and breeding.

Poultry economics is that branch of poultry husbandry that is occupied with the commercial aspect of poultry farming, particularly the marketing of poultry and eggs.

Poultry hygiene is that branch of poultry husbandry that concerns itself with the maintenance of the health of poultry.

Which, now, of these three branches of poultry husbandry is most important? Please do not think me immodest when I tell you that I consider the last named—hygiene—by far the most important. It is natural for the specialist in each one of these lines to feel that *his* work is THE work. For *him*, it is.

If one studies the catalogues of the many different agricultural colleges he will be struck with the marked absence of poultry hygiene or poultry pathology from the curriculum. But its absence is not the reason that I believe it is the most important or the most to be sought after.

Hygiene when operating in its widest yet legitimate scope is practically coextensive with biology.

This involves every phase and condition of the living organism; it also includes all those subtle relationships of the physical sciences with what we call the science of life. Biology started out to be the science of the living organism in its normal condition; it was soon apparent, however, that pathology, the science of disease, must be given a place in its classification. Then it came to be recognised that in the study of disease not only must we include therapeutics or the science and art of treatment of disease but a most prominent

place had to be allotted to hygiene, the study of the laws of health and its preservation. Any one who has attempted to specialise in hygiene has found himself face to face with every division of biology, even classification. In human medicine we have long noted the "diseases of civilisation" and the peculiar immunity of uncivilised peoples from them. Again, there has been recognition of the awful susceptibility of the Negro and Indian races to diseases to which the Anglo-Saxon by centuries of exposure, has acquired a certain amount of immunity. The same is true in poultry husbandry. Who would not prefer to purchase his stock from a flock of "rangers" rather than invest in the third or fourth generation of "back-yard" or "town-lot" poultry. Most observant poultrymen can tell you the differences that exist among their Asiatic, Mediterranean and American breeds as to susceptibility to disease in chickhood and adult life. One of the strong points claimed for certain breeds that are just now being largely exploited is the dominating influence of their disease-resisting powers.

I referred to the point of contact between the physical sciences and biology. A man may be, as the result of close observation, an apparently successful feeder, but he cannot be an intelligent feeder to-day unless he possesses some knowledge of the chemistry of digestion and the chemistry of foods. Permit me to quote from a very recent and most interesting article: <sup>1</sup> "The animal body is the most complicated and wonderful piece of machinery in the world. It is the only engine which generates its own power, disposes of its waste products and automatically renews its parts. Within the compass of the human frame is an elaborate hydraulic system having not only a double acting force pump but also a suction pump for the purpose of producing a negative pressure in the veins and to assist the return circulation. The nervous system may be likened to the telephone system of a great city for it has all the local call stations and also a central station, which we call the brain, which is so complicated that, elaborate as are the switchboards in our great exchanges, they are simplicity itself compared with the brain. The digestive system forms the furnace in which the fuel is received for the generation of power, while the skin, kidneys and lungs make up a complicated apparatus for getting rid of the waste products of combustion."

It is this piece of machinery that the poultry husbandman is operating when he is *feeding* for eggs or *breeding* to standard. It is this machine from which the commercial poultryman is planning to turn out a supply of attractive and toothsome

\* Paper read before the American Association of Instructors and Investigators in Poultry Husbandry.

<sup>1</sup>Bristow, Algernon E., M.D., The Unity of the Medical Sciences. Journal of the American Medical Association, Vol. lli. No. II., p. 844, opening paragraph, March 13, 1909, Chicago.

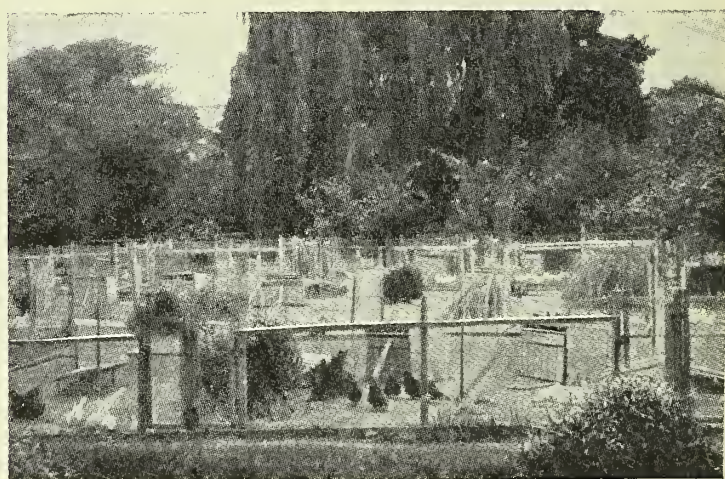


table fowl to catch the eye and tickle the palate of the epicure, hygiene purposes to keep this machine in order, oil all its parts, keep it in repair, tell you how, in the best possible manner, to obtain a new one, lacking all the defects of the old one, possessing features that will place it far away and ahead of the old. It is, in reality, hygiene that will tell you that your machine is sure to snap and go to pieces if you work it too hard, and can explain to you the rationale of the breakdown. Poultry pathology, as a branch of poultry hygiene, will tell you why your 250-egg hen dies before she reaches that fascinating number. It is poultry pathology that explains to you that the 200-egg hen is a monstrosity, an abnormality, and as such is far more susceptible to disease than the average hen of much lower egg laying ability. Not only is this hen peculiarly subject to disease but all the hens that have, as we might say, formed stepping stones up to this much sought-after product of breeding and commercial enterprise are likewise markedly susceptible to disease because of the abnormal regime to which they have been exposed.

An enterprising poultrywoman brought to the writer a dead hen for autopsy. Examination revealed an hypertrophied ovary, marked congestion and at the same time extreme thinness of the walls of the egg tube. Through this tube an egg had ruptured into the abdominal cavity. There were no other lesions. To my inquiry concerning the use of "forcing" foods, she replied, "I am breeding and feeding my White Leghorns for eggs; I obtain forty cents per dozen all the year round; I could sell one hundred dozen as easily as I now sell fifty dozen. I can afford to lose one of these hens every few months (that had been the record) and keep on forcing." Here was poultry husbandry with hygiene in the background, that is to say, breeding, feeding and marketing in defiance of hygiene. It is true, there was a strong appreciation of hygiene for its general purpose; that woman desired to guard against an attack on her flock by an infectious disease, and she wisely brought the dead bird to a pathologist for investigation. But when it came to a question of the pathology of egg-production she allowed the commercial element to overbalance all other considerations. A splendid business capacity suggested that it was better to lose four birds a year from diseased ovaries and oviducts due to excessive functioning than to lose, by cutting out the forcing foods, the large egg production with its generous receipts. As stated above, for *her*, poultry economics was the chief thing. And the writer, as a pathologist, agreed with her. But hygiene, incarnate in the poultry pathologist of an agricultural college must furnish to poultrymen, who are breeding, feeding, and marketing, such data as is contained in Bulletin 166 of the Maine Agricultural Experiment Station. On page 83 of this bulletin, Doctors Pearl and Surface, in their summary, state, "The daughters of '200-egg' hens were in this experiment very much inferior to their mothers in average egg-production." Even

though hygiene may not yet be given a distinctly separate place in the curriculum of poultry studies, still pathology, as a chief division of that subject, might be allowed to dominate the teaching. Let me show you what I mean. Anatomy and physiology are taught in the schools at present, but, I think I can safely say, largely with reference to alimentation and reproduction, especially as bearing upon the commercial side of poultry culture. Let it be taught also with reference to disease. Study the anatomy and physiology of the eye, nose, and throat, as being the seat respectively of ocular, nasal, oral and pharyngeal roup. Study the windpipe of clicks as being the seat of gape disease so as to understand why one gape worm might be the cause of death, and also to appreciate the difficulties attendant upon some of the proposed instrumental measures recommended for the cure of the disease. Learn the anatomy and physiology of the air sacs so that you may realise better the dangers connected with the air sac mite. Learn all you can about the ceca, their structure and function, and then remember they are the usual seat of intestinal coccidiosis. Study the cloaca in order that you may be familiar with the locality which you should sometimes carefully investigate and explore with a well-vaselined finger in search for an obstructing egg or fecal concretion.

No more important industry exists to-day than poultry. Its position among the industries is growing in recognition. The colleges must come to honour it as it deserves. The writer believes that a whole four year course of studies in an agricultural college could be built up around poultry. It must be a masterly move on the part of the instructors in poultry husbandry to map out such a course, and thus prove to young men and women that in fitting themselves to run intelligently a poultry farm they would be securing a broad training, involving not only a fundamental general science course, but also a technical agricultural education that would include every phase of farm life, thus enabling the graduate poultryman to meet every requirement for the well-being (health) of his flock.



Well-arranged poultry pens on an Australian farm.

[Copyright.]



## WHY I RECOMMEND ARTIFICIAL HATCHING.

BY FRED. W. PARTON. (*The University. Leeds.*)

ARTIFICIAL incubation has made rapid strides during the last decade, and the evolution of the incubator from the earliest known machine made in this country, down to the most modern of present day manufacture, shows an improvement which is commensurate with the increase in their use. Despite, however, the great and wonderful improvements, much has yet to be done before they are perfect, and an enormous field is open for research work with a view to discover what element is lacking, or in what direction there is superabundance. Research may discover the reason, so far as the machine is responsible, for the oftentimes small percentage of chickens hatched.

turning necessary to the eggs; their position to ensure exact distribution of heat, air, and moisture. In spite of a lack of scientific knowledge, artificial incubation is an undoubted success, and its increasing adoption everywhere is a tribute to, and has been largely responsible for, the development of the poultry industry. Probably one reason why incubators are used to such a great extent is the growing demand for eggs, to meet which demand breeds of the non-sitting races are largely kept.

The advantages of artificial incubation are many, but it depends to a very large extent upon the individual poultry-keeper as to what is the most striking benefit that he gains by artificial



**"The Farm Yard is a favourite place for Fowls."**

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Wonderful results are now and again recorded, such as ninety-eight chickens out of a hundred eggs, but these, of course, are exceptional. There are many theories as to the reasons for unsatisfactory results, some of which are quite plausible, while others are simply ridiculous. While incubators are very nearly perfect from the mechanical point of view, there are many directions for investigation; such as the question of humidity; the amount of evaporation; the strata of air between the eggs and the tank; the amount of

methods. It depends upon the extent of the operations whether the initial cost of an incubator is warranted. If the poultry-keeper has merely a pen or two of birds, and is not doing anything out of the common, making no attempt to specialise in any direction, then he will usually find that the natural way is more to his purpose. But for the more ambitious man, who aims for greater things, artificial incubation has many and distinct advantages.

The fancier, who produces his birds as early as is permissible in preparation for the chicken shows,



will undoubtedly find that by their use his task is simplified very considerably, and this is probably one of the greatest advantages of artificial over natural incubation. Of course, we do not mean to say that this cannot be done by the aid of the hen alone, since we know several of the most successful fanciers, who are generally prominently to the front in classes for birds of the year, who depend solely upon one or other of the most reliable sitters. For instance, silkies may be relied upon to become broody after they have laid a nest of eggs, and there are many fanciers who pin their faith upon the ardent sitting propensities of this breed. But the problem is to get this nest of eggs which is necessary so as to bring into play their natural proclivities. It is undoubtedly a most reliable sitter, but is it reliable also as a layer, at a time of year when its services are required? Many declare it to be so, but they may possess the knack of gaining their end by hatching them at a certain time, and forcing them to lay just at such a period that they may be relied upon to become broody at the crucial time. Other poultry-keepers may lack the experience to manage them in such an excellent way, or perhaps they must give all their time, care, and attention to the perfecting of their particular breed, and cannot devote attention to the proper management of the Silkie that is necessary if it has to be turned into an incubator at a given time. This is a somewhat big task, since the Silkie can only cover rather less in number of eggs than might be entrusted to a bigger breed. The result of this is that it would require, say, ten or eleven Silkies to do work that could be accomplished by an incubator of a hundred egg capacity. With proper care and attention to the essential points in the management of the machine, and, of course, provided that the incubator is a good one, of a reliable maker, and placed in a suitable room there should not be the slightest difficulty in securing chickens in readiness for the specific time. Thus we find a manifest advantage to the fancier by adopting artificial methods.

The utilitarian gains even more benefits from the same source, benefits of a more various character. As a matter of fact, there are few branches taken up by the utility man where advantages do not accrue by the aid of artificial incubation. Taking first egg-production, especially those produced in autumn and winter; the chickens for this purpose can be hatched earlier than if the broody hen is employed, and furthermore the place of some of the most persistent sitters can be filled by one or other of the more prolific breeds. We do not, of course, wish to see a diminution in the number of sitting breeds, or else the winter supply of eggs will be woefully lessened. They are the most prolific during the cold months, and if they bring off and rear a batch of chickens, at a time of year when eggs are plentiful, and what they would have laid can be dispensed with, it will even increase their winter laying powers. For this reason the hen's services need not be dispensed

with, but it is certainly advantageous to use the incubator as the main source of hatching, supplemented by the broody hen. A further advantage is that to produce the same number of chickens by means of hens that could be hatched from, say, two or three incubators of a hundred egg capacity each, would mean practically double the amount of time and labour.

The production of table chickens is a further direction in which artificial incubation confers even greater advantages than it does when egg-production is the chief object. Reference to the market quotations for table chickens throughout the year shows that the highest prices are obtained from December to June, and the highest of these months are April and May. When chickens are hatched by hens very frequently they are not ready for market till about the middle of August, and on till October. This is the time of year when the very lowest prices are obtainable. It will be readily understood that to have the chickens ready for consumption from December to June they must be hatched at other than the usual hatching months. This may certainly be accomplished in the old way, but it is by the newer method that the bulk of them can be got ready. Most praiseworthy efforts are being made at the present time to develop the production of the best class of table chickens, and it is gratifying to find that it is bearing fruit, in that poultry-keepers in many districts are giving attention to table poultry in a way never previously attempted. They grasp the fact that there are only certain breeds, and crosses, that will produce the best class of table poultry, and that preparation is required if the birds are to be placed upon the market in the most approved fashion. This is perfectly true, the right breeds must be kept, and they must undergo some sort of preparation. But sufficient importance has not been placed upon the time of year of hatching. Therein lies the secret of the whole matter, it is no use producing table chickens, however good they may be, if they are not marketed until August. It is in this direction that the incubator is of great value, in that hatching operations can be conducted both early and late in the year.

I was informed the other day by a man who claimed to have had forty years' practical experience, that the two chief objections to artificial incubation are first, that the mortality is considerably higher among the artificially incubated chickens than it is among those that are hatched naturally, and secondly, that artificially hatched chickens are not so strong, nor do they grow so rapidly as those from under the hen. With this I most heartily disagree, and declare strongly in favour of artificial methods. While not having had forty years' experience, I can claim to have had half that length of time and experience with both natural and artificial incubation, and I am convinced that the death rate is lower, and that the chickens are quite as hardy, and grow as rapidly as do those that are hatched naturally.



## AN EGYPTIAN EGG OVEN (MAMAL EL FIRAKH).

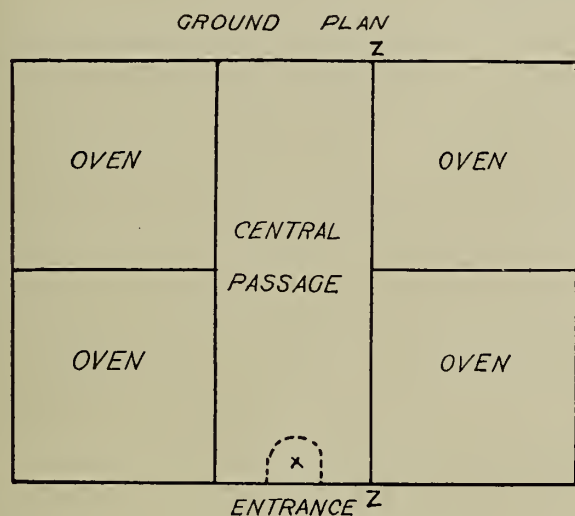
*Notes made by Harolde Jefferys, after visiting an Egg-Oven belonging to a Copt named Askulla, at a small village about thirty miles north of Assuan.*

THERE is usually considerable difficulty in persuading an owner of a mamel el firakh to show a foreigner, or even an Egyptian, over one of these primitive incubators, though they are quite numerous and are found throughout the Nile Valley from Alexandria to Assuan. The secret of this structure and management is carefully guarded. The hatching of chickens by this method is an important industry. It is almost entirely in the hands of the Copts, who make quite a mystery of the whole process.

the upper chamber, which is dark, each egg being held up in a ray of sunlight, which comes through a hole in the dome roof made for this purpose. Usually one-quarter to one-third of the eggs prove infertile. It is said that very few which are left in after this first testing fail to hatch.

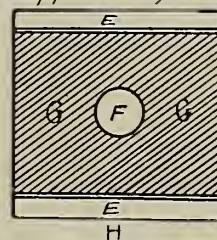
The chicks hatch between the sixteenth and twenty-third days, and it is usual to attempt to regulate the temperature so that the chicks may hatch out on the twenty-first day. The temperature is regulated by manipulating the fire (often the fire is allowed to go out for a few hours) twice each day and by regulating the ventilation. Testing is by the hand and by placing the eggs on the eyelid. A thermometer seemed to be quite unknown and apparently unnecessary. No artificial moisture is provided, no pans of water were found in either

### MAMAL EL BEID



PLAN OF UPPER CHAMBER

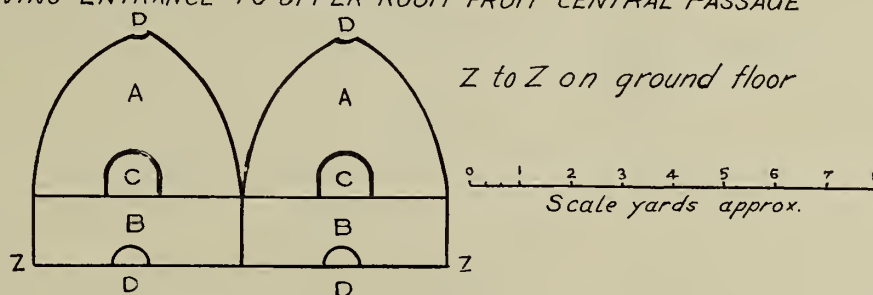
*Floor under EE. This one inch. Do under GG Thick and supported by two arches of mud bricks.*



*E. Trough for fire. F Entrance to Oven.  
G. Floor of mud bricks.  
H. Entrance from Centre Passage.*

ELEVATION SHEWING ENTRANCE TO UPPER ROOM FROM CENTRAL PASSAGE

- A Upper room
- B Lower room or oven
- (Hatching Chambers)
- C Entrance to upper room from central passage.
- D Ventilators



Plan of an Egyptian Egg Oven.

[Copyright.]

The "ovens" are worked only from February to May each year. The one visited consisted of four hatching chambers, each of these chambers, about four by four yards, being capable of holding up to 6,000 eggs at a time, and accommodating each season about 180,000 eggs. When the eggs are first put in the hatching chamber they are often piled up four or five deep, but are afterwards spread out in a single layer, this never later than the tenth day. The eggs are turned three times daily. On the fourth or fifth day they are tested, and all the infertile ones are taken out and sold for human consumption. The testing is done in

the upper or lower chamber, neither are the eggs ever sprinkled with water.

The owner of the egg oven buys eggs at from six to ten for one paistre (one paistre—about two-pence halfpenny) and sells the chickens at from three to five for a paistre. Another arrangement is sometimes made. A farmer brings eggs, and the owner of the "egg oven" gives him forty-five to fifty chickens for every hundred eggs. Immediately the chicks hatch, they are taken out from the hatching chamber and placed in a cooler, well-ventilated place to dry, and are never fed until the third or fourth day after hatching. They are said



to travel best when dispatched to purchasers on the third day after hatching, and are never fed before being dispatched.

The fuel usually used is wheat or bean straw, chopped and mixed with a certain amount of animal manure. The upper chamber is consequently full of choking smoke, and there is always a lot of smoke in the hatching chamber. The mud-brick walls are made very thick, and doubtless retain the heat well and prevent sudden changes of temperature. Every time the eggs are turned care is taken to remove those which have been immediately under the fires, and place them in the centre of the chamber; this is said to be a most important point.

The mamal el firakh described is quite a small one. It is said that many consist of from ten to twenty hatching chambers, each four by four yards.

## A PORTABLE INCUBATOR HOUSE.

(See page opposite).

Considerable care is needed in the construction of an incubator house in order to prevent any rapid changes of the temperature inside the room. Although a brick-built house is much to be preferred, yet it is possible to get very good results with a properly designed wooden structure. In the first place it is most essential to use best quality timber, for however good the workmanship is, it will not overcome the defects of badly seasoned timber.

**DIMENSIONS.**—These are ample for six incubators and include a small room for lamp trimming, etc. Inside length is 14ft., width 7ft. 10ins., height to ceiling 6ft. 7½ins. The whole of the inside is boarded with ¾in. matching, ceiling with ½in. matching, and floor with 1in. boards.

**VENTILATION.**—This is an important item and is arranged so that fresh air is drawn inside through perforated openings under the window in front, shown at V., passes between the outer and inner matching and enters the room close to the floor, at O. The inside air is drawn out through perforated panels in the ceiling, at G, and is carried out through the openings at the end of the house.

**FRAMING.**—This is made of 2½ins. by 1½ins. batten, both ends, and back and front made in pairs. Ends framed edgeways of batten with joints as indicated at A. Full width to be 8ft. 4½ins., height to eaves, 7ft. 3ins., total height, 12ft. 3½ins. Opening for top ventilator to be 15ins. wide and 18ins. high. Rafters 7ft. long, notched into the top corners of frame. Front framing made with wood worked flat, joints as shown at B. Total length to be 14ft. and height 7ft. 3ins. Door opening to be 2ft. 6ins., and window opening 4ft. Middle rail 3ft. 6ins. from top and diagonal braces in openings as shown. Back framing made

to same dimensions, but the middle rail is carried right through, and upper portion of framing corresponding with door opening to form window.

Partition to have four uprights and upper and lower rails, door opening to be 2ft. 6ins. wide and 6ft. 6ins. high. Total height of partition on a level with top of outside framing. Framing secured together with screws or bolts and fitted on lines of brickwork as suggested in sketch at S.

**FLOOR.**—7ins. by 1in. tongued and grooved boards nailed on joists as indicated in sketch of framing and in section at C.

**BOARDING.**—Inside as well as outside covered with ¾in. matching, beading round door and window openings. Ventilator openings made in front, covered with perforated zinc and protected with hood as shown in section at D and E. Partition to be boarded on one side only.

**ROOF.**—The ceiling should be boarded with ½in. matching and two or three small openings made at equal distances apart, about 15ins. from sides, as indicated at G., these should be covered with zinc. Intermediate rafters should be fitted, and a 16ft. by 6in. by 1in. ridge board fitted. Matching should be used to cover and nailed to rafters securely. Felt roofing will be found most satisfactory as a covering and may be capped with wooden capping as shown at R. Barge boards at each end will improve the appearance. End ventilation procured by framing with sloping boards as indicated at F, rear of louvre boards to be covered with fine netting or perforated zinc.

**WINDOWS.**—Framed up out of 1½in. by 1¼in. wood, cut from short ends of framing material. Hung with butt hinges from top.

**DOORS.**—These should be bought ready made, hung with butt hinges and fitted with any suitable furniture.

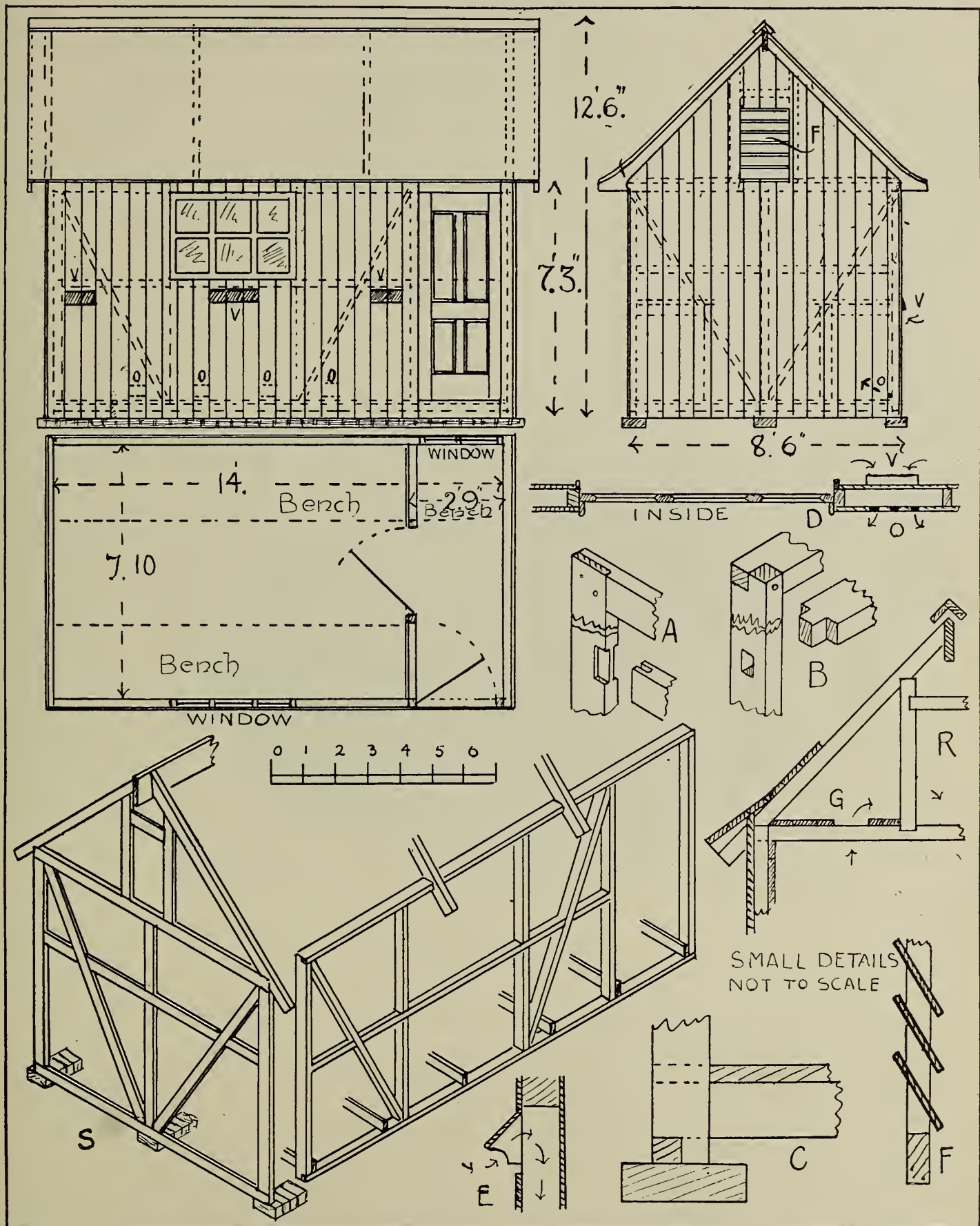
**INTERNAL FITTINGS.**—2ft. 6ins. wide benches should be made of floor boards and nailed to frames made of 2½in. by 1½in. stuff. Bench fitted under window in passage.

**PAINTING.**—At least two coats of good oil paint should be applied to the outside, and the inside should be sized and varnished.

### APPROXIMATE COST OF MATERIALS.—

500ft. run 2½in. by 1½in. at 5/- per 100ft. run	...	1	5	0
33ft. „ 4in. by 1in. at 4/- „ „ „	...	1	4	
16ft. „ 6in. by 1in. at 1d. per ft. run	...	1	4	
1¼ square floor boards, T & G, 5in. by 1in. at 13/3 per sq.	...	1	3	2
8 squares matching boards, T & G, 5in. by ¾in. at 9/6 per sq.	...	3	16	6
1¼ squares matching boards, T & G, 6in. by ½in. at 7/9 per sq.	...	10	8	
Two doors, 6ft. 6in. by 2ft. 6in., 5/9 & 5/4 each	...	11	1	
Felt roofing, 25 sq. yards	...	6	9	
Sundries	...	19	2	
Total	...	8	15	0





PLANS OF A PORTABLE INCUBATOR HOUSE.

(For description of which see preceding page).

[Copyright.]



## THE INVISIBLE CHICKEN.

TWELFTH ARTICLE. READY FOR HATCHING.

*Written and Illustrated by JAMES SCOTT.*



THE hatching of a chicken is a far more remarkable phenomenon than is usually supposed. Soon after the pretty little creature has broken forth from its shell, and shaken itself in the air, the inquisitive observer is struck with the contrast between its new and previous sizes. It seems too large to have been accommodated within its three-week's prison case. It would, indeed, test the skill of a person to fold up the chicken and replace it in the shell as neatly as it had previously existed. The feat might almost be regarded as impossible. The peculiar manner in which the chicken lies tucked up inside the egg is depicted in Figs. 1 and 2.

No greater contrast could be imagined than that between the chicken as it appears just before the period of hatching, and in the few moments succeeding the process. We take an egg that is ready to deliver its young and curious contents and very carefully crack the shell. We find that the white fibrous membrane still adheres to the inner surface of the limy exterior, but has an increased degree of stiffness, while the whiteness is intensified, and is almost china-like in its opacity. Many people erroneously believe that this membrane is concerned in some way with the protection of the chicken; but apart from containing a quantity of the elements of nutrition, absorbed by its sponge-like meshes, it is of no importance in this respect. It must be regarded as a kind of binder for the microscopic granules of lime which together compose the shell.

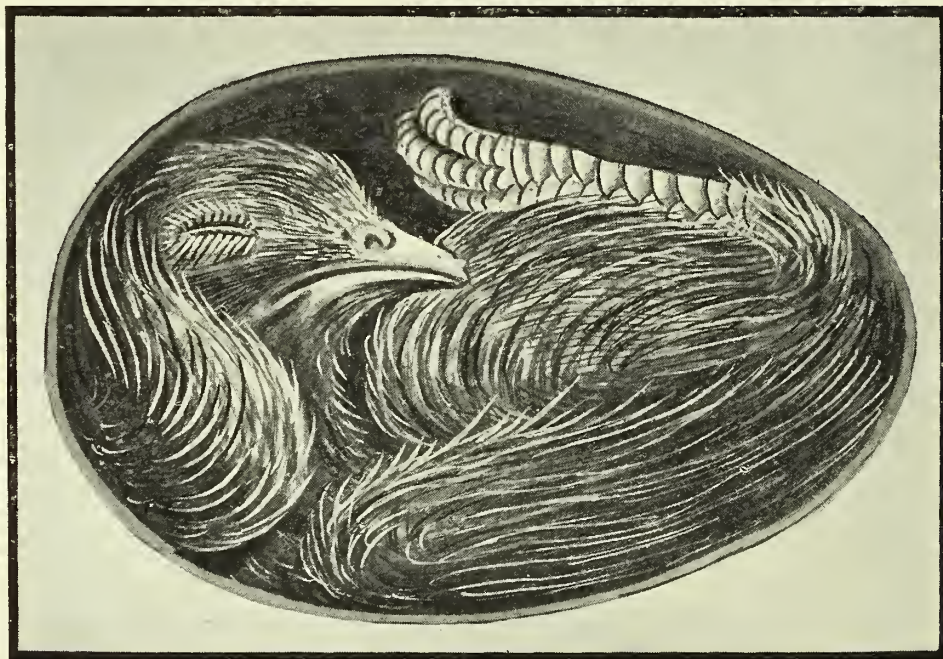
This membrane appears to be less fibrous and flimsy in the final stages of egg modification.

This state is, however, deceptive, because the fibres are still present, but their inter-spaces are choked up by colourless secretions which make the membrane more solid and uniform.

Just underneath the shell membrane is another of flexible jelly-like character, which is traversed in all directions with a network of blood-vessels full of the peculiar oval corpuscles, the shape of which proves the chicken's relationship with reptiles. This sheath is otherwise transparent, and fits so tightly round the unborn chicken that it is a very difficult matter to separate it. The slightest touch is sufficient to rupture it, when, on account of its elasticity, it

automatically gapes wide open. This is the allantois, expanded entirely between the double fold of the amnion or real sheath. The allantois starts as a small bladder and gradually works its way between the layers of amnion which encircle the bird.

I have before pointed out that the embryo is at



**Fig. 1—Side view of opened egg, with chicken ready to hatch; the covering membranes have been removed.** [Copyright.]

first enveloped in a veil, known as the amnion. This practically becomes the sheath along with the allantois. The embryo disc gradually separates from the yolk; and the skin closes tightly around and over it in every direction. This covering is double, and the inner layer is curiously arranged. It would be tedious, and almost unnecessary, to describe it in detail.

These amnions, as they are called, are found round the embryos of mammals, birds, and land reptiles, but do not occur with creatures that are born in water, where the surrounding medium acts as a pad to prevent injurious concussion.



Between the embryo and lower or under layer of the sheath is a quantity of fluid which serves as a buffer to the developing chicken. Hidden shocks, such as might be occasioned by an egg rolling or slipping, are rendered ineffective by this means. Otherwise, the tender embryo might sustain irreparable damage to its body or limbs.

Air is absorbed through the pores of the shell by the membrane carrying the blood-vessels, and so maintains the chicken until it is called upon to use its lungs in the outer air. Readers will know that at various periods the air-space in the end of the egg proves useful for similar purposes. In the new-laid egg the fibrous white double membrane that sticks to the inner surface of the shell is separated at the broader end, and the space between these layers increases almost hourly during the earlier periods of incubation. In due course, however, the chicken fills up the space.

As the embryo enlarges, and the yolk-sac in consequence gets smaller, the almost indivisible sheath fits tightly round them. If we examine the contents of an egg before the shell cavity is filled up, we shall find that yolk and embryo are well wrapped together, while layers of thick albumen envelope all. Although the yolk-sac diminishes in size, the total bulk of its connection increases. That is to say, yolk becomes embryo, and the embryo become larger than the yolk was, so that eventually the whole space inside the egg gets crammed with chicken, and the layers of albumen entirely vanish.

Meantime the wrapper has kept pace with the increase, and has always been fitted tightly round the developing bird.

At this point I will remind readers that I have throughout this series of articles used the word embryo in preference to the more exact one of foetus for convenience. Moreover, it sounds much better. Strictly speaking, the embryonic stage is confined to earlier dates in which there is hardly any resemblance to a normal chicken; whereas the foetus means the developing creature when it has assumed some likeness to the form as we know it in the hatched state.

It has been stated in previous chapters that a tooth or projection appears quite early on the outer extremity of the upper beak. This becomes very prominent towards the last, and is often quite sharp—comparatively so, of course. Its use is to help liberate the chicken from its wrapper and shell.

It will be understood that if the creature were to open its mouth—that is, its beak—while it was inside the egg it might get a supply of undesirable fluid, or a scrap of its fleshy surroundings, or the hairs which so curiously

envelope it. The tooth therefore proves very serviceable. It should be remembered, too, that in the confined space occupied by the folded-up head, there is no room for leverage to be obtained to give direct blows—at any rate at first—with the tip of the beak itself to the enclosing substances. It can, however, move its head round inside the egg.



**Fig. 2. Front view of chicken ready to hatch. The covering membranes have been removed.** [Copyright.]

At the right moment the wrapper is torn by means of the tooth, and as this covering slides back and causes an opening, the beak becomes more available for use in splitting the white fibrous membrane lining, and breaking open the hard shell. We can, of course, only surmise what really happens in the egg during hatching, but it is certain that Nature would not provide this strange tooth unless it was intended to aid liberation, especially as it is persistent from an early stage in the development of the embryo right up till the time of hatching, and has to be worn off soon afterwards. If it simply indicated some remaining feature of ancestors, it would gradually be obliterated instead of remaining in its pronounced state. Fig. 3 depicts hatching.

The shell is composed entirely of minute roundish or hexagonal shaped granules of lime,



adherent side by side like the bricks of a wall. These are still further strengthened by the presence of the white fibrous membrane which sticks to their interior. Now, it might be a fairly easy matter for a full-grown hen to peck open a shell from outside, where it could gain a "purchase" for the thrust; but the wrapped up chicken would be too feeble to accomplish this so smoothly. When it has ripped open its wrappers it would remove a few of the brick like granules, and the tooth on the beak would assist

in rasping against the edges of others, and so helping to dislodge them. The fibrous wrapper adjoining these granules could also be better torn and removed by such a tooth.

When the shell has been broken open as symmetrically as possible, the chicken flounders out, and is apparently hairy. Soon, however, these "hairs" are resolved into downy feathers, as already described, and the hitherto invisible chicken becomes **VISIBLE**.

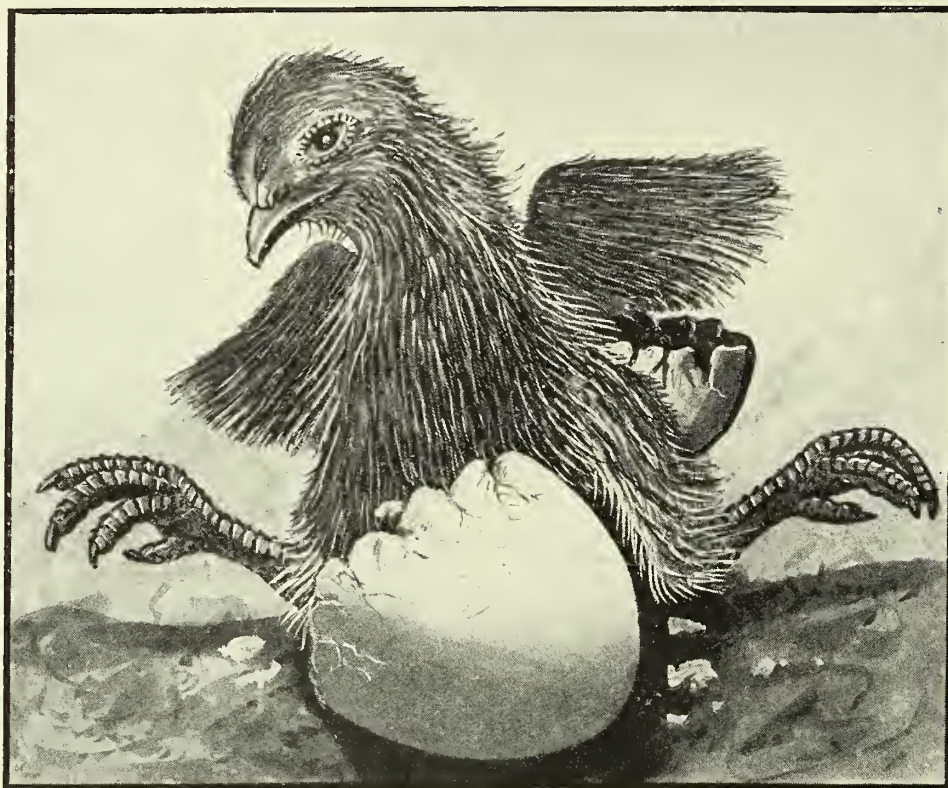


Fig. 3.—A chicken newly hatched, righting itself from a prostrate position.

[Copyright.]

## THE PAUCITY OF THE BRITISH HEN.

Diagrammatical Story of What is the Present Position.

By "STATISTICIAN."

THE three maps which are now given are intended to indicate how much remains to be done ere the poultry population of the United Kingdom is equal to meeting the actual and possible requirements of our people in respect to eggs and poultry.

Adopting the basis of three fowls per acre of cultivated land, which is generally regarded as the possible average throughout the country without interference with any other stock or existing crop, and accepting the statistics published by the Board of Agriculture and Fisheries for the 1908 Census, so far as adult poultry is concerned, I show in these maps how much of each of the four countries would have been actually occupied in 1908, had all the fowls been concentrated on the three per acre basis.

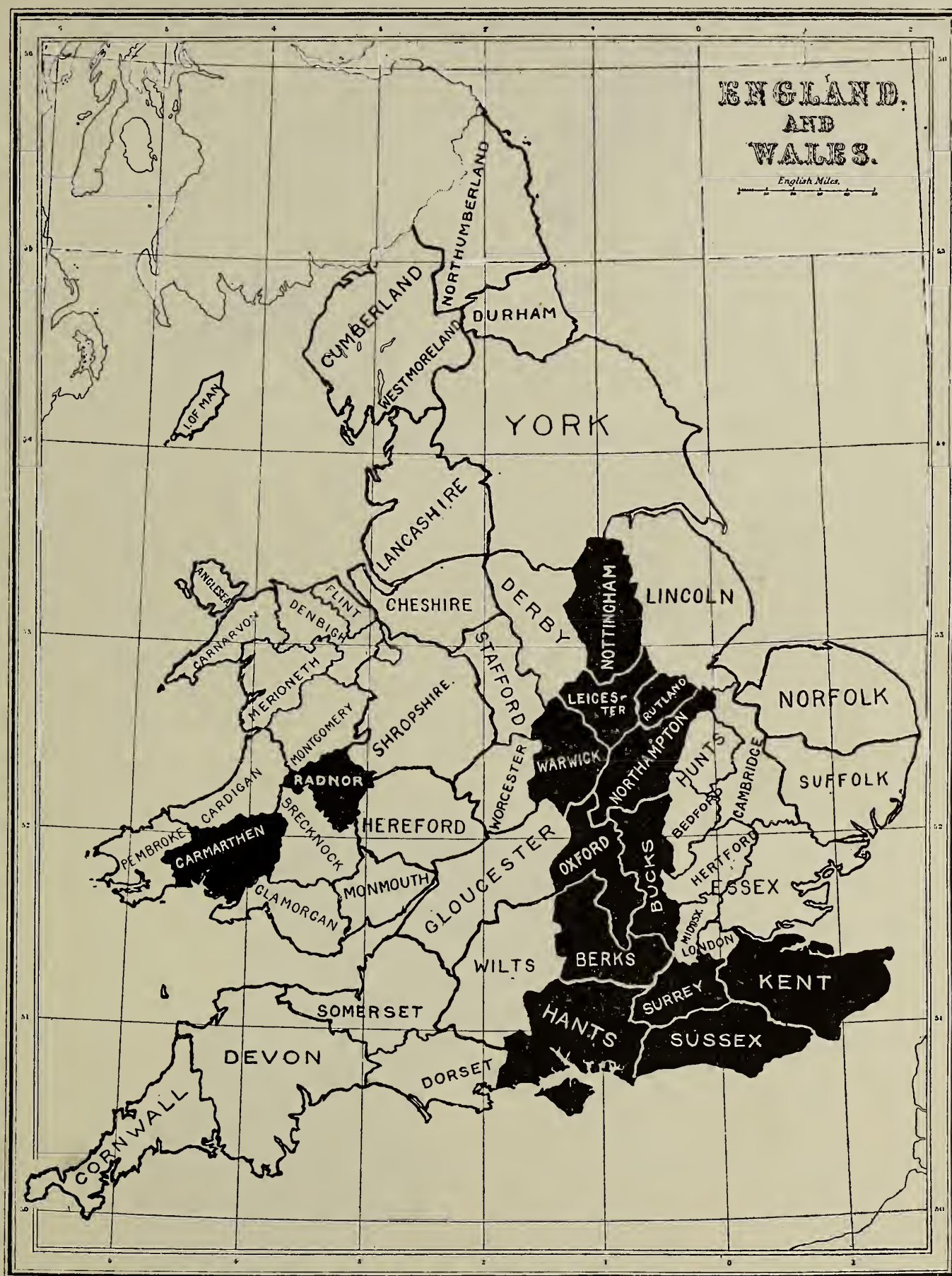
In order, however, to state the case fairly, I have applied the principle laid down in my

article which appeared in the October issue (page 27), namely, that one adult goose or turkey is equal in the amount of land required for its maintenance to five fowls or ducks, which means that not more than 12 geese or turkeys shall be kept per 20 acres, *on which no other poultry are kept*. By doing so the relative values are maintained.

Taking the Countries in their respective order, the results are as follows:

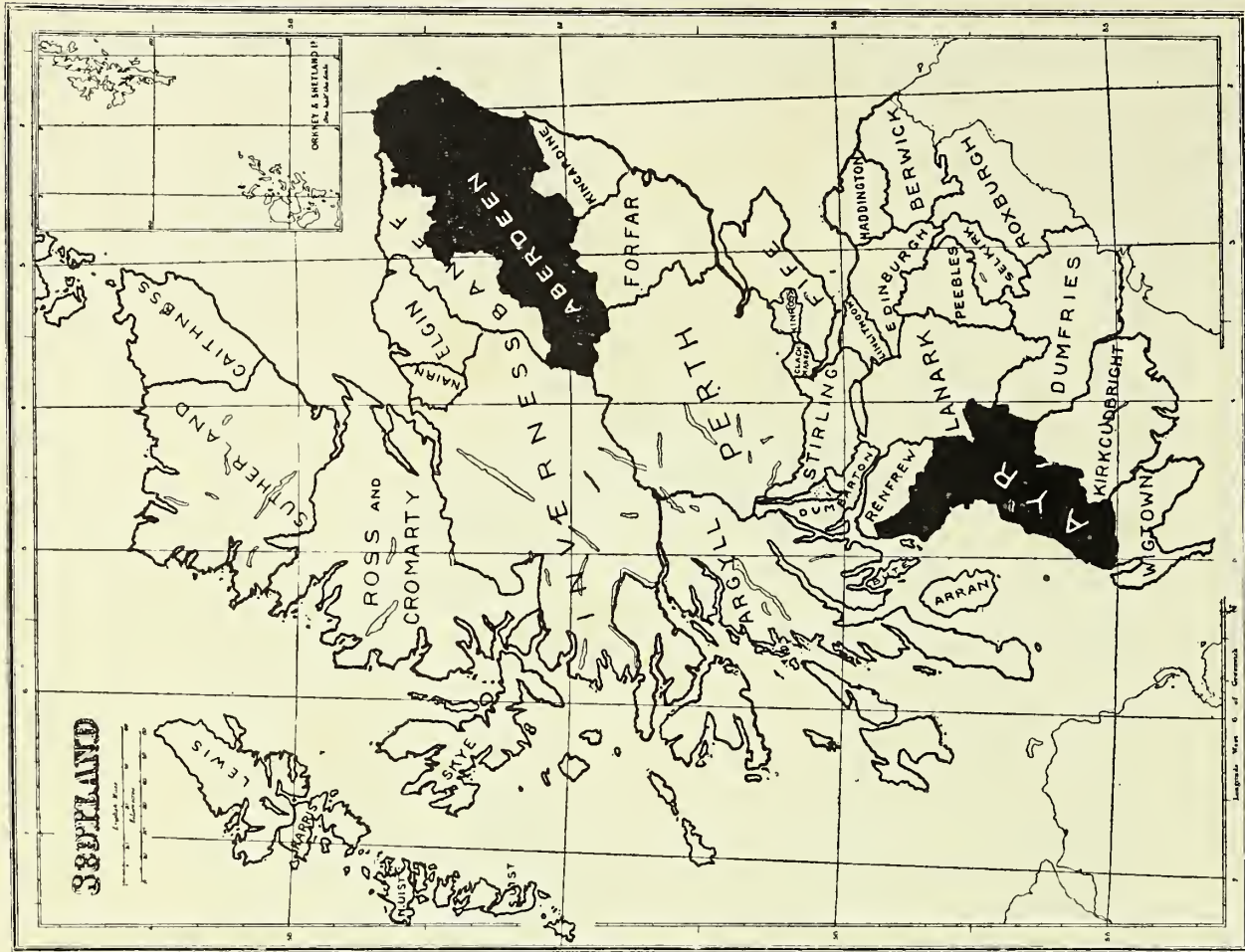
**ENGLAND**—Adding adult fowls and ducks and multiplying geese and turkeys by five, there were in 1908 the equivalent of 16,105,000 fowls, or enough for a population of 5,368,300 acres. In the country were 24,498,426 acres of cultivated land. Therefore, only 21.93 per cent of the land was effectively occupied. I find that in division 2a, which comprises Kent, Surrey, Sussex, Berks and Hants, and division 2b, which includes Notts, Leicester, Rutland, North-



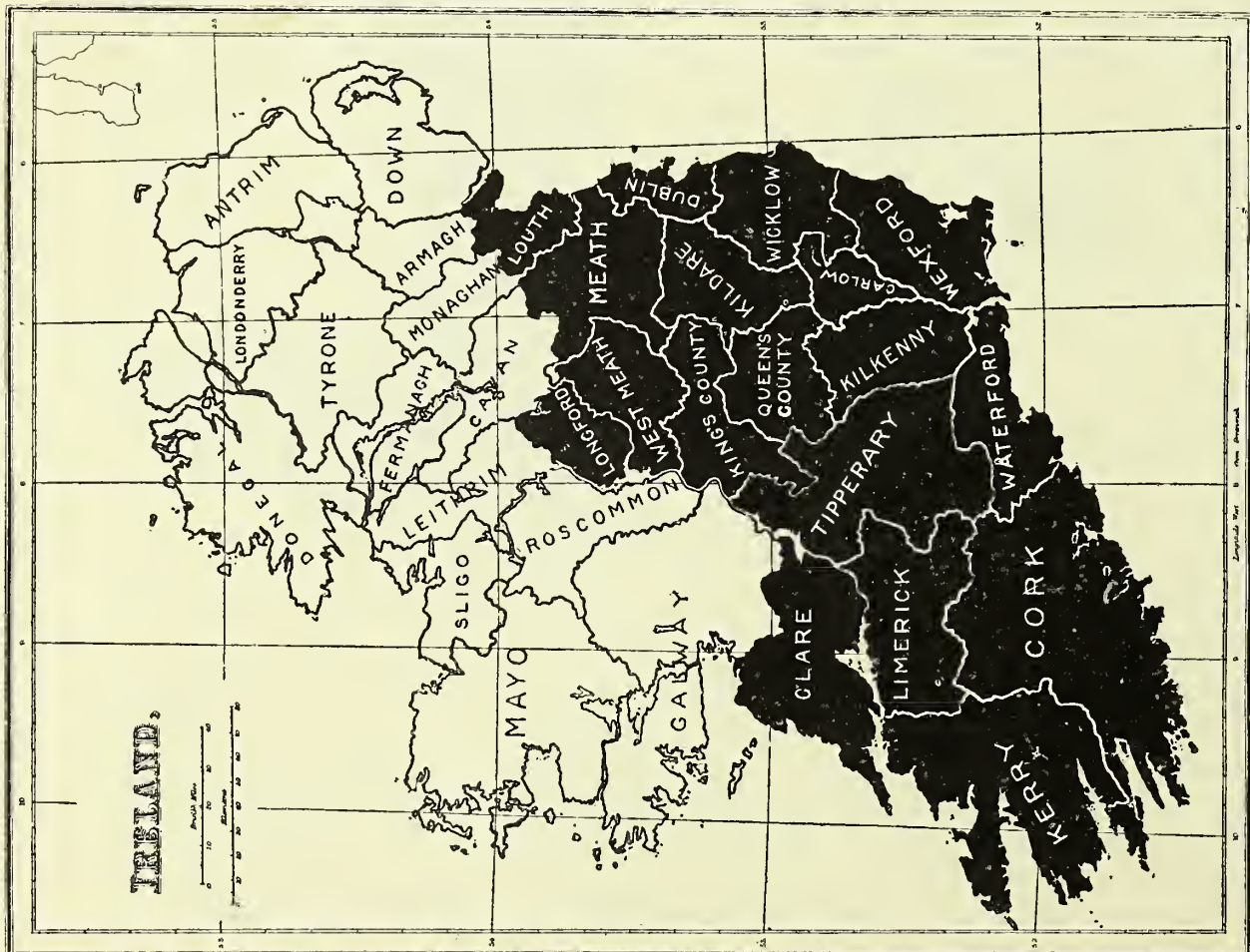


On a three-fowls-per-acre basis all the poultry on English farms in 1908 would have been sufficient only to populate the 12 counties shown in black; and in Wales only the 2 counties shown in black. [Copyright.]





Scotland is the least developed in poultry keeping of the four sections of the United Kingdom. In 1908, on a three-fowls-per-acre basis, there were only poultry enough to populate Aberdeen and Ayr. [Copyright.]



In Ireland the poultry population is much greater than in Britain, and practically was half occupied in 1911. [Copyright.]



hants, Bucks, Oxon and Warwick, there are 5,582,133 acres of cultivated land, and that there were in the year named not enough poultry in all England to populate these counties. On the map they are shown in black. The extent of the white areas show the possible deficiencies.

WALES—The principality had, on the same basis, the equivalent of 1,818,000 fowls, enough for 606,000 acres. In Wales are 2,770,397 acres of cultivated land, so that in this case only 21·87 per cent. was effectively occupied. In the counties of Carmarthen and Radnor are 601,509 acres of cultivated land (shown in black), and these could nearly maintain as many as were found throughout the entire country in 1908.

SCOTLAND—In the northern kingdom the area of open lands is proportionally much greater than in any other section of the kingdom, but I adhere to the same basis, although considerable areas of these could be used for poultry. The poultry recorded were in 1908 equal to 2,809,000 fowls. Hence it is only occupied to the extent of 19·31 per cent. The counties of Aberdeen and Ayr comprise 946,851 acres of cultivated (shown in black), so that these could more than maintain the poultry found in the whole of Scotland.

IRELAND—As is well known Ireland has done more than the three countries already dealt with. The poultry recorded in the current year are equal to 17,069,427 adult fowls, or sufficient for 5,589,809 acres of cultivated land. The total area is 9,846,584 acres, and is occupied by poultry to the extent of 57·78 per cent., or nearly three times as much as either of the other countries, yet more than all the Irish poultry could be kept in the provinces of Leinster and Munster, in which are embraced 5,867,072 acres of cultivated land.

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#### FOUR POINTS IN MANAGING AN INCUBATOR.

FIFTY years ago, to work an incubator successfully required constant care and attention, and some mechanical skill on the part of the manipulator. Even then good results were by no means a certainty. Incubators are now, however, constructed upon entirely different lines, and, so far as the machine itself is concerned, results can be foretold very accurately. When the difficulty of automatic regulation of the temperature was overcome by one of the most ingenious inventions ever applied to artificial incubation, it was thought that nothing more was required, and that the whole question was solved. The regulating apparatus is, of course, the main feature, and without it all else would be useless. At the same time there are other items that each contribute their quota. There are many important points in the management of an incu-

bator that must have attention, and if only one of these points is neglected, it may make all the difference between success and failure. Probably the four points that are of greater importance than any of the others are, first, the room in which the incubator is worked; second, moisture; third, cooling; and fourth, the management at the actual time of hatching out. When the operator has the choice of rooms in which to work his incubator, the greater care should be taken to insure having a place that has walls sufficiently thick to resist the outside atmosphere as much as possible. This applies especially where hot air machines are used, since these are more easily influenced by a change from hot to cold, and vice versa, than are machines with the steadying influence of a tank. The room should be one in which there is a steady influx of fresh air. A through current is not a necessity, in fact it is inadvisable, unless the current is, at least, five feet above the top of the machine. It will have a very damaging effect if the current of air plays upon the incubator.

Moisture is necessary during the process of incubation for several distinct reasons, the most important being that by a proper supply of moisture the egg retains within the shell the moisture that is necessary for the development of the embryo chicken. If there is not adequate outside moisture, too much is drawn from the eggs to allow of proper development in the early stages, and to allow of growth in the later period of incubation. Moisture is also an important element in keeping the shell and membrane in a pliable condition, so that when the time arrives the chicken has no difficulty in breaking its way through the shell and the membrane.

Cooling is a further matter that should have due and proper attention. There are many poultry keepers who do not attach sufficient importance to this matter; their one anxiety seems to be to get the hen back again to her eggs as quickly as possible. This, however, is a mistake, since it is imperative for the well-being of the chickens that the eggs should be cooled. During the first week of incubation the eggs should be cooled for ten minutes, and for the second week, twenty minutes, while the last week twenty-five to thirty minutes exposure should be allowed. We are now, however, speaking from a general standpoint since the atmospheric conditions must be taken into account, but in an ordinary hatching season the chickens will be all the stronger if the eggs are cooled for the length of time we have indicated.

The treatment of both the eggs and chickens at the period of hatching requires skilful management. When the eggs are turned on the nineteenth and twentieth days, they should be examined and the chip in all the eggs that have reached this stage should be placed uppermost so that it may facilitate the exit of the chickens from the shell. The door of the incubator should not be unnecessarily opened during the process, since a chill to the half emerged chickens may cause trouble.



## MAMMOTH INCUBATORS AS USED IN THE UNITED STATES OF AMERICA.

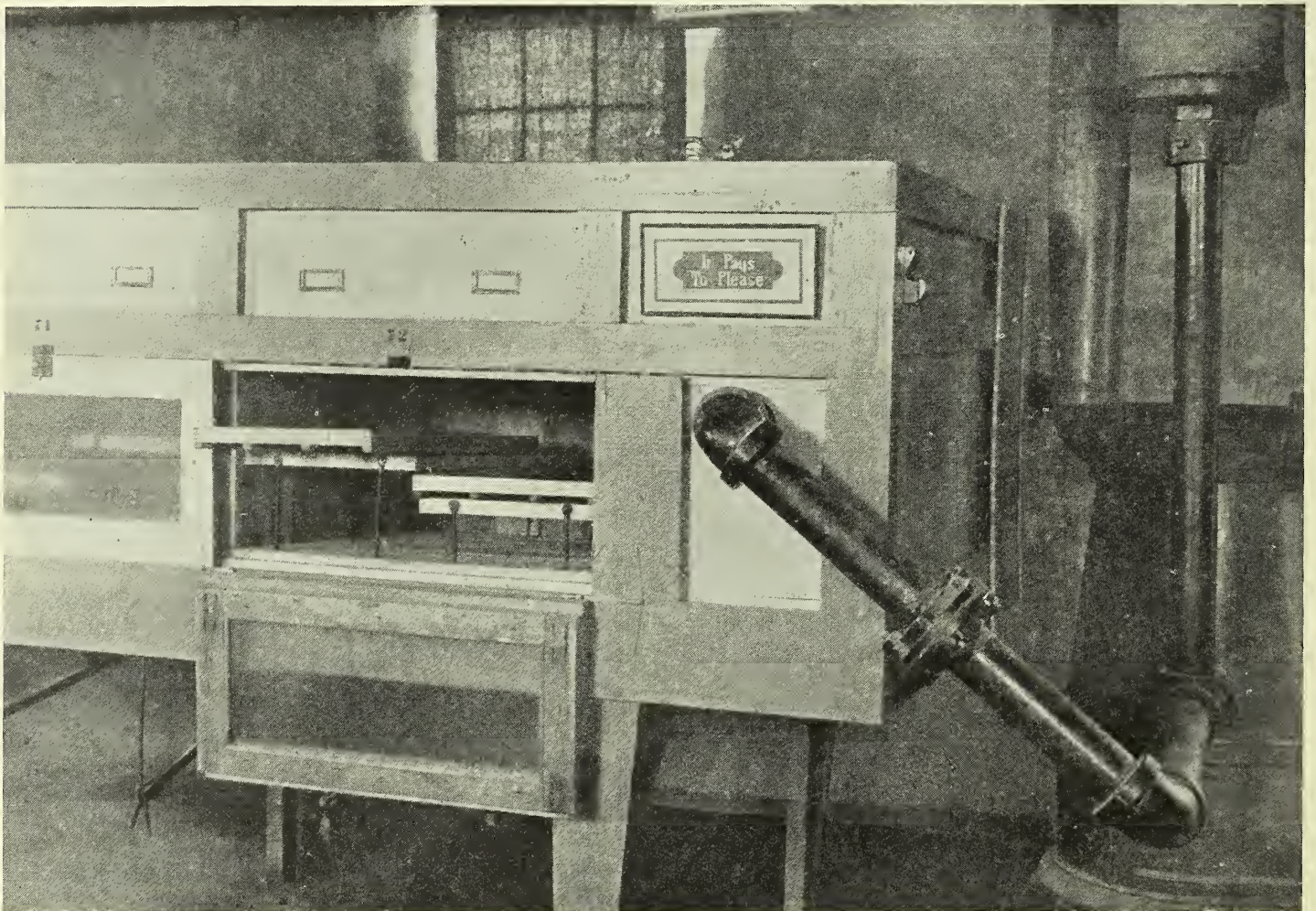
BY PROFESSOR J. E. RICE, Cornell University.

THE building of mammoth incubators in the United States is on the increase. There are now at least seven of these large hatching machines in use in the State of New York alone. So far as I have been able to learn through correspondence, and, in three instances, by personal inspection, the large machines are proving, as a rule, quite satisfactory when properly managed. The chief advantages are economy of time in handling the large machines, less danger from fire, less expense for fuel, less trouble on account of dangerous gases, formed by the combustion, where many oil-heated lamps are used, and greater purity of the air, due

ture is adjusted by various valves and thermostats connecting the incubator with the boiler and by the raising or lowering of the egg trays.

These mammoth incubators are arranged in three series; that is to say, are heated by three separate heating systems. In each instance the heating is done by hot water pipes. At the far end of the incubator building is the boiler room, separated completely by a solid wall partition from the incubator cellar proper. I understand, indirectly, that this mammoth hatching enterprise has proved successful in the hatching of ducks during the past season, which is the first time it has been tried.

While it is self evident that these mammoth machines can only be used on a few of the largest poultry establishments of the country, the tendency for small poultrymen to send their eggs to the large hatcheries for incubation at three or four cents apiece for the chickens hatched, or at about



**The heating arrangements of an American mammoth incubator.**

[Copyright.]

to not using up the oxygen in the incubator cellar, as compared with the heating of incubators with lamps.

Six of the machines above alluded to hold, approximately, seven thousand eggs each. One holds twenty-eight thousand duck eggs or thirty-two thousand hen eggs. The above photograph shows the heating arrangements in one of these huge machines. The regulation of the tempera-

ture is adjusted by various valves and thermostats connecting the incubator with the boiler and by the raising or lowering of the egg trays. This is due, no doubt, to the desire to avoid the first cost of purchasing a number of small incubators, the labour required to handle them where the farmer's chief occupation is not that of keeping fowls, and also, to a large extent, to avoid the danger from fire because of the fact that insurance companies, as a rule, object to insuring houses in which incubators are operated.



Whether or not the mammoth incubator idea and the hatching of large numbers of chickens at central points, to be shipped as day-old chicks to various parts of the country, will continue to grow it is impossible to predict at this time. There are several difficulties in the way, one of the chief of which is the possible danger of injury to the chickens in transit from various causes, such as chilling, smothering, delays, etc. At present this special feature of the poultry industry seems to be gaining in favour. It is quite likely, however, that for many years to come the great bulk of the chickens hatched will be by the poultry men themselves through the medium of large machines constructed to meet the capacity of their own plant. It is more likely that these plants will have incubators constructed to be heated from a central system. In other words, the general trend is towards the simplifying of hatching and the reduction of the first cost of the investment and economy in the handling of the machines.

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### SILVER BEARDED POLISH FOWLS.

BY GEO. E. PEER.

(See *Frontispiece*).

I HAVE been requested so many times lately by friends and customers to put into print some of my experiences in breeding Silver Bearded Polish fowls that I am tempted to write a few reminiscences.

It was either in 1875 or 1876 that I first secured birds of this variety. They came from Wolcott & Fonda, of Fairport, Monroe County, New York, who were at that time the leading breeders of Silver Bearded Polish fowls in America, and I wish to state right here that few better Polish have ever been bred, than came out of this firm's yards.

Messrs. Onley & Ball, then of Hartford, Connecticut, created quite a sensation with their immense importations of these beautiful birds about that time, and England was full of good Polish breeders. How few of the old guard are left now, and fewer Polish breeders than ever. This new fangled Will-o'-the-Wisp "Utility Proposition" having permeated the whole poultry world. In those good old days people encouraged their hobby for breeding fancy poultry for the true love and recreation derived from it, and not for the almighty dollar, as now-a-days.

Silver Bearded Polish are strictly speaking, a fancier's fowl, they appeal to the refined, and to lovers of art. They are favorites with the ladies, and their strikingly handsome plumage (black and white) makes them the centre of attraction either in the yard, upon the lawn, or in the exhibition hall.

Owing to their large crests these birds must be kept in a warm, dry sheltered place, but are as

hardy as any class of poultry that we are acquainted with. They are very quiet in disposition and require very little exercise, consequently they can be kept in a very small yard or run and thrive amazingly.

There is no breed of fowls more suitable for the novice to handle, or easier to breed. One great advantage they possess over many other varieties, is that only one mating is required to produce both fine exhibition cockerels and pullets, and under most ordinary circumstances they breed very true to type, shape and colour of plumage. In fact, if the breeder starts with the right kind of stock in the first place, and gives them proper care and attention, very few will be the culls or disqualified birds that he will have in his yards to kill off when Autumn comes. Practically every bird raised will do fairly well as an exhibition bird.

Another remarkable thing about Silver Bearded Polish is that if a cockerel or pullet is a high class exhibition bird it seldom degenerates, but really improves with age, and some birds are as good in plumage at five and six years of age as when a year old.

Personally I never breed from a Polish, if I can help it, until they are two years old, as one secures much better markings and harder feather, than if breeding from immature birds. Again, I seldom breed from more than three or four females in a year and never have more than two yards mated up from which I sell eggs for setting, and in these yards not more than a half dozen females are allowed each mature male bird.

Outside the true fancier's love for breeding fine birds, I do not know of any variety that will pay much better profit in dollars and cents. Invariably each season I am compelled to return egg money that is forwarded me, and never can I begin to supply my friends with the birds they order. Silver Bearded Polish are great layers of a nice sized white egg, are non-setters and not good mothers. I usually use a Plymouth Rock hen for hatching the eggs, as no Polish eggs will hatch in an incubator, especially if put in with eggs from other varieties. I cannot give the reason for this, but it has proven so with me.

I do not think of setting any eggs for myself until the month of May, as Polish are very fast growers and if attended well make fully as quick a growth as any of the Leghorn family.

In conclusion permit me to say to any lady or gentleman who desires to keep a profitable fowl, one they know is unapproachable for its exquisite beauty, try the Silver Bearded Polish.

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### Poultry Market at Sydney, N.S.W.

The Municipal Council of this City has erected a large poultry market which is said to be built on the best principles and well equipped.



# THE POULTRY INDUSTRY IN 1912.

By EDWARD BROWN, F.L.S.,

*Hon. Sec., National Poultry Organization Society.*



It has been said that "Imagination is an advanced perception of truth." So far as the poultry industry is concerned, whilst we may have to some extent passed the imaginative, and are in the constructive period, a realization of the possibilities is yet far off. It is towards the latter that efforts have been largely directed, in respect of advancement of production and organisation, of the adequate provision of education in all its branches and of investigation, inclusive of what may be termed experimental work, that is, with a definite commercial end as distinct from research. Whilst it is true that the progress made during the year under review in these directions has not been as great as we had hoped, it must be realized that constructive work is necessarily slow.

The Poultry Census taken in 1908, published in June last by the Board of Agriculture and Fisheries, whilst, unfortunately, not fully determining the total production of eggs and poultry in Great Britain, in that no occupation under an acre in extent was included in the enumeration, reveals the fact that upon the general farms of the country, to which we must look for the bulk of home supplies, the progress made is by no means as great as had been looked for. In the year named there were only an average of 583 adult poultry of all grades per 1,000 acres of cultivated land, or, on a corrected basis, the equivalent of 640 fowls per 1,000 acres, that is, nearly  $6\frac{1}{2}$  fowls to every 10 acres. The poultry population, therefore, is shown to be much below our national needs and opportunities. The unsatisfactory feature of this Census, as I have previously pointed out, is the altogether inadequate estimate as to the annual value of eggs and poultry produced in Great Britain. Inclusive of smaller occupations than an acre, and of suburban poultry yards, that value must be at least £9,000,000 per annum. It might be three, if not four times as much.

A notable event of the year was the international meetings held in London last July, at which a World's Association of Poultry Instructors and Investigators was formed. Called as I was then to be its first president, it is not fitting that more be said at this time, except that the preliminary work cannot be rushed, especially when the members of the Council are distributed all over the earth, and that it is hoped support will be forthcoming from our own and other Governments, enabling us to found in London a Bureau to be the centre of light and leading in this subject for all nations.

As already indicated, progress in some directions has not been as rapid as was hoped. The proposed National Poultry Institute, to which reference was made in the report for 1911, is not yet an accomplished fact. The money required to enable the Provisional Committee to take advantage of the

grants promised from the Development Fund has not yet been secured. Until that is so the scheme cannot be carried out. Also, there is little to report in respect to extended teaching of poultry-keeping at Agricultural Colleges, by County Education Committees, or in the establishment of Farm Institutes. In these directions, however, movements are at work which will, we anticipate, speedily result in a consistent and thorough system throughout the country. Further, the re-organization of the Agricultural Organization Society is completed, and a large grant allocated to it for promotion of agricultural co-operation, from which it is expected there will be large results.

Whilst in the development of a great industry success must be achieved by individual energy and enterprise, these can be promoted and helped in many ways by central support. For that reason the grant made to the Utility Poultry Club for a year's Laying Competition on an adequate scale, and that made for an experiment in Cheshire in respect to the rearing of table chickens on intensive lines, are welcome, giving signs of a wider recognition than previously known. The former of these demonstrates the capacity of hens under favourable conditions, even though the basis of the competition is not on commercial lines, and the club referred to is to be congratulated that its pioneer work is being recognised at home and its example followed in other lands. What we now desire to see is a competition which, both as to the number of fowls in each lot and conditions under which they are kept, shall conform to the opportunities of producers, and, also, as to progeny tests, which, however, is a much more difficult task than an ordinary laying competition. As to the table poultry test, that is experiment and not demonstration. I have seen so many failures, in this and other countries, of attempts to rear chickens on such highly intensive lines, that it is necessary to point out the desirability of waiting for the final results, which cannot be discerned in a single year, ere the system described is adopted by producers. That the Board of Agriculture should give its support to such an experiment can be heartily welcomed. It is, also, satisfactory to note that a Table Poultry Club has been founded, which, if wisely directed, should do much to help this branch of the poultry industry, which has not received the attention it deserves.

Intensive methods are now commanding a large amount of attention. That more can and will be done in the future there is no reason to doubt. The impelling needs of our vast population demand increased production, and we have by no means exhausted our capacity in this direction. It is, however, not so simple as some advocates have suggested. The main dangers are in respect to loss of vigour in the stock as a result of abnormal



breeding and management, and accumulation of influences which tend to degeneracy and disease. What we have to learn is maintenance of that balance of nature to upset which means ultimate failure. Pioneering is always costly, even though it is necessary.

On the whole, so far as production is concerned, the year under review has been satisfactory, although the summer was not favourable to rapid growth of chickens, though much better than a hot, dry season. Certain it is that prices have been higher than ever, and so far as I am aware there has not been evident as yet any serious check to demand as a result, although there are signs that this is imminent. The country has, however, rejoiced in an abounding prosperity with great purchasing power. At the same time such enhancement of prices has serious dangers. If continued, as must be the case unless production is advanced to a greater extent, there can hardly fail to be a lessened sale of home produce. That is more especially the case during the winter months, as I do not think the spring values have yet reached their legitimate point so far as eggs are concerned.

The main difficulties of 1912 have arisen from a serious shortage of eggs during January and February. In the latter month prices for eggs were higher than ever known before. This was followed by an unprecedented slump in March, due partly to a rush of such supplies and to the coal strike, during which period producers and traders lost heavily. The taking of a couple of million people from the ranks of consumers, as well as the closing of railway communications, meant disaster. That was followed by other strikes, and later in the year by the war in the near East, so that the year has been one of great anxiety for all classes of the community. Had it not been for a rapid recovery as a result of general good trade the effect would have proved much more serious.

With respect to the Christmas demand for table poultry, some interesting features may be mentioned. Turkeys were in good demand, especially for the medium sized specimens. As one salesman said to the writer: "The day of the big turkey is over." That is a fact to be kept in mind by breeders of these birds. Prices were, however, very good up to a given point, when alarming reports as to

possible shortage frightened consumers, and led dealers to hold their supplies too long, which, together with unfavourable weather, caused a slump, so that the results were most disastrous to wholesale traders, who lost heavily. What we have now to aim for is extending the period of consumption, and not concentrate on the Christmas season. Geese were very scarce, and the rates obtainable for good specimens higher than have been known for some years. Ducks were short, but I have never felt able to suggest that producing winter ducks is profitable. Large winter fowls—that is, the so-called capons—were in great demand, and this is a branch of the industry as yet hardly touched in this country, but one which is capable of great and profitable development.

The Trade and Navigation Returns for 1912, just published, again indicate a decided increase in values, and the total for the last year is the highest recorded. The following statement shows the net imports from British Colonies and foreign countries, after deducting re-exports of poultry, as there are none of eggs:—

	1910	1911	1912
Eggs ...	£7,296,145	£7,965,809	£8,394,524
Poultry...	788,131	840,014	763,925
Totals	£8,084,276	£8,805,823	£9,158,449

As seen below, the increase in total values of eggs, amounting to more than a million pounds sterling in two years, is due to advanced prices, as the growth in quantities is nominal. It is important to note that the first half of the year was below the corresponding period of 1911, so that the advance is due to greater supplies in the last six months.



**BLUE ORPINGTON DUCKS.**

[Copyright.]

The property of M. Joaquim A. Monteiro of Lisbon, Portugal.



Taking eggs, in the first place, the returns state that last year the number imported from all countries outside the United Kingdom was 19,085,052 great hundreds, or 2,290,206,240, which is equal to a fraction over 159,000 tons, compared with 19,057,895 great hundreds, or 2,286,947,400, or 158,000 tons in 1911, so that the volume of supplies is very slightly over those of the previous year. The maximum year in quantities, as I pointed out a year ago, was in 1904, in which period the quantities were 19,942,549 great hundreds, or 2,381,867,640, equal to 166,000 tons, and the declared value £6,730,574. Thus, in 1912 our imports were fewer than in 1904 by 857,497 great hundreds, or nearly one hundred and three million eggs, equal to more than 7,000 tons, yet we had to pay for the lesser quantity £1,663,950 more.

The subjoined table shows the figures of the respective countries enumerated in the returns, with percentages of quantities:—

#### EGGS IMPORTED, 1912.

From	Quantities gt. hds.	Values £	Percentages of quantities.
Russia ...	9,677,098 ...	3,951,028 ...	50.71
Denmark ...	3,623,815 ...	1,942,573 ...	18.98
Germany ...	524,677 ...	220,506 ...	2.75
Netherlands ...	801,227 ...	378,988 ...	4.2
France ...	669,687 ...	308,511 ...	3.51
Italy ...	958,344 ...	471,584 ...	5.02
Austria-Hungary	997,987 ...	422,360 ...	5.23
Other Countries	1,832,217 ...	698,964 ...	9.6
Totals ...	19,085,052 ...	8,394,524 ...	100.00

Russia has declined by 2.08 per cent. (364,792 great hundreds), Denmark has declined by 1.97 per cent. (369,171 great hundreds), Germany has declined by 0.28 per cent. (52,878 great hundreds), the Netherlands has increased by 1.01 per cent. (193,863 great hundreds), France has increased by 0.09 per cent. (17,651 great hundreds), Italy has increased by 0.79 per cent. (187,237 great hundreds), Austria-Hungary has declined by 0.13 per cent. (24,567 great hundreds), and other countries have increased by 2.29 per cent. (439,802 great hundreds), as compared with the percentages of 1911. It is evident that "other countries" call for further division, more especially with respect to Egypt, Sweden and Morocco.

Again we have to record a further advance in average values, which are here given in alternate years since 1898:—

#### AVERAGE VALUES OF ALL IMPORTED EGGS.

s. d.	per gt. hd.	s. d.	per gt. hd.
1898 ... 5 10		1906 ... 7 6½	
1900 ... 6 5½		1908 ... 7 10½	
1902 ... 6 7½		1910 ... 7 11½	
1904 ... 6 9		1912 ... 8 9½	

The increased average values in 1912 over 1911 is 5d. per 120, and the increase over 1910 is 10d. per 120. The advance in average values from 1898 is no less than 2/11½ per great hundred, or just over 50 per cent., which fact should form abundance of subject matter for careful consideration.

The figures for the respective countries and groups enumerated are:—

#### AVERAGE DECLARED VALUES OF IMPORTED EGGS.

From	1910 per gt. hd. s. d.	1911 per gt. hd. s. d.	1912 per gt. hd. s. d.
Russia ...	7 1½	7 6½	8 2
Denmark ...	9 9½	10 2	10 9½
Germany ...	7 10½	8 1	8 4½
Netherlands ...	8 9	9 3¼	9 5½
France ...	9 2¼	9 3¼	9 2½
Italy ...	9 5	9 6	9 10
Austria-Hungary	8 1½	8 4¼	8 5½
Other Countries	7 4	7 6	7 7½

It will be seen that with the solitary exception of French supplies there has been an advance in average values of all imported eggs. Nothing is more striking than those from Russia. In 1900 these were only valued at 5/6 per 120, since which time the increase has been equal to 2/8 per great hundred.

As announced in my last Annual Report the Trade and Navigation Returns from January, 1912, have contained the weights as well as the values of imported poultry, and also a discrimination between live and dead poultry. I am informed, however, by the Statistical Department of His Majesty's Customs, that pigeons are classed with live poultry, so that the usefulness of these figures is minimized. This is supported by the statement that in 1912 896039 live poultry (?) were imported, of a total value of £38,779, which works out at a fraction over 10d. each. I have left these, therefore, out of the following calculations so far as 1912 is concerned:—

#### IMPORTS OF POULTRY.

From	1910	1911	1912
Russia ...	£303,260	£404,994	£342,275
France ...	163,527	116,267	158,399
Austria-Hungary	79,607	92,597	97,641
United States of America	88,144	137,469	79,454
Other Countries ..	186,754	166,870	129,648
Totals	£821,292	£918,187	£807,417
Less re-exports of Colonial and Foreign	33,161	78,183	82,271
Net	£788,131	£840,004	£725,146

The decreases in supplies from Russia, the United States of America, and other countries are considerable. It is necessary to mention that in 1910 and 1911 pigeons are included, but these would probably not exceed £30,000 per annum in value. Allowing that amount the decrease in 1912 as compared with 1911 is £85,000.

As stated above we are now able to show the declared average values per cwt. of imported poultry, and I have added these, as in the case of eggs.

#### QUANTITIES AND VALUES OF IMPORTED POULTRY.

From	Quantities in cwts.	Values £	Averages per cwt. s. d.
Russia ...	123,063	342,275	55 7½
France ...	35,644	158,399	88 9½
Austria-Hungary	28,296	97,641	69 0
United States of America	23,978	79,454	66 3¼
Other Countries	36,185	129,648	71 8
Totals	247,166	807,417	65 4¼



The higher average of French supplies is doubtless due to the large portion of high-class turkeys for the Christmas trade.

The exports of poultry produced in the United Kingdom were as follows:—

Alive	...	Number	45,004	...	£26,232
Dead	...	cwt.	2,524	...	10,780

The last named works out at an average of rather more than 8os. per cwt. In this connection my attention has been called to the fact that a considerable export trade in high-class English table poultry might be established, and I hope to do something to bring the opportunity before those concerned.

We are now in a position to estimate the total consumption of eggs and poultry in the United Kingdom, although, as I have pointed out above, the production returns published last June respecting the year 1908 are unsatisfactory, first, that holdings under an acre were not enumerated, and, second, that the values were considerably under estimated. The following may be accepted as a conservative estimate:—

Colonial and Foreign imports	...	£9,158,449
British produce	...	9,000,000
Irish	...	5,000,000
Total		£23,158,449

These figures do not represent retail values, but those at British ports in the case of foreign, at the point of shipment in that of Irish, and at local markets in Great Britain for native produce.

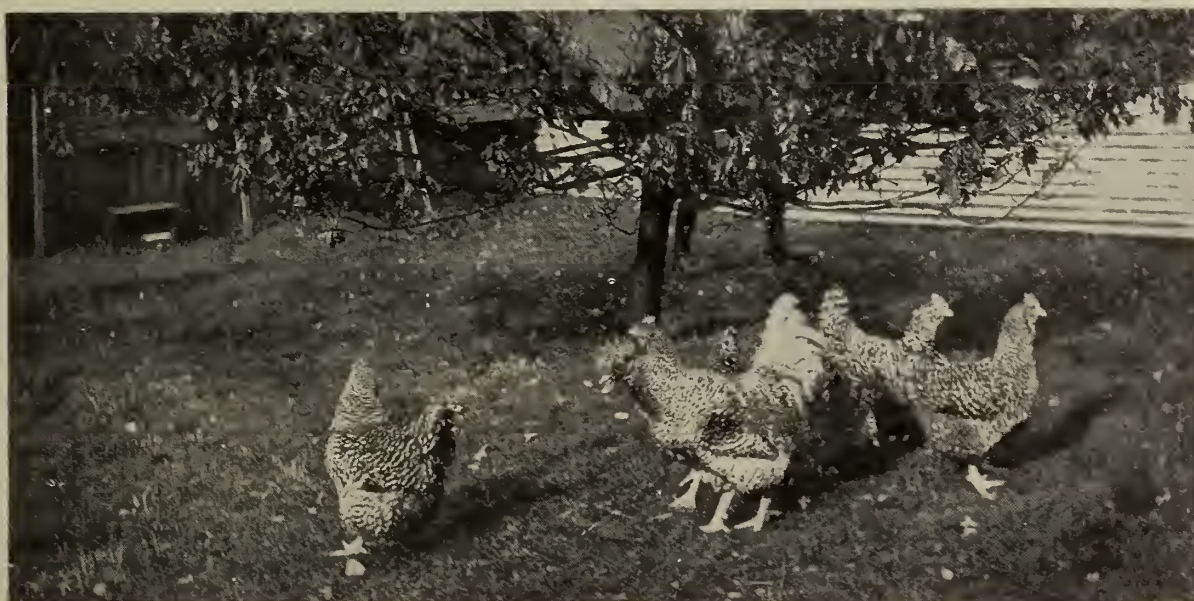
*National Poultry Organization Society,*  
38, Queen Anne's Chambers,  
Westminster, S.W.,  
January, 15th, 1913.

## PROBLEMS IN EUGENICS.

Papers communicated to the First International Eugenics Congress, held in London, July 24th to 30th, 1912. *London: The Eugenics Publication Society, 490pp., 8s. 6d. net.*

The study of heredity in its widest aspects is commanding wide-spread attention on the part of scientific men in all civilised lands, not alone in relation to animals and plants destined for the food or pleasure of man, but also in respect to the human race. In all these directions the problems arising from intensification of breeding and production on the one hand, and of the effects of our overcrowded towns and cities on the other, demand that questions hitherto left to the ordinary course of nature and the evolution by ordinary laws, shall be controlled if that can be accomplished. Reactively, all knowledge gained may possibly be applied to every branch, and, therefore, it is desirable that poultry breeders shall give attention to the theories promulgated, for we are yet largely in the stage of theory, for as our knowledge of heredity increases in any direction we may gain help for our special side of operations.

The volume before us contains much that deserves careful study and attention. The papers deal with many aspects, some of which are as yet doubtful in their application. One paper dealt with poultry work, that by Dr. Raymond Pearl, of Maine, entitled "The Inheritance of Fecundity," giving a brief statement of the observations made by him in his researches into the heredity of egg production. This, we understand, will be given at greater length in a Bulletin to be issued by him and which, it is hoped, may throw fresh light upon what is a very important question to the practical poultryman.



A Pen of Guckoo Orpingtons belonging to Major Barnes. (See pages 228, 229).

[Copyright.]



## A SUFFOLK POULTRY FARM.

MAJOR H. M. Barnes, whose head-quarters are at Stonecroft, Ipswich, stands in the very front rank of poultry breeders and exhibitors.

He has been sufficiently long in the poultry world to have proved that he can breed birds of the highest quality. While in the initial stages of his enterprise he displayed soundness of judgement in his purchases, he leaves nothing to chance, and has proceeded on the lines that make for efficiency and success.

Stonecroft is a well-equipped modern poultry farm, and the extent of the operations, the number of birds, as well as the variety of breeds and the completeness of the methods employed take a visitor by surprise.

Although only half a mile from Ipswich railway station as the crow flies, the farm stands high above the town, the house and buildings occupying a splendid position, with a magnificent view of the town. Except for this view it would be hard to realise the proximity of a town, so rural are the surroundings. There is an unlimited expanse of grass and the slopes supply a natural system of drainage, which makes it an ideal spot for poultry rearing.

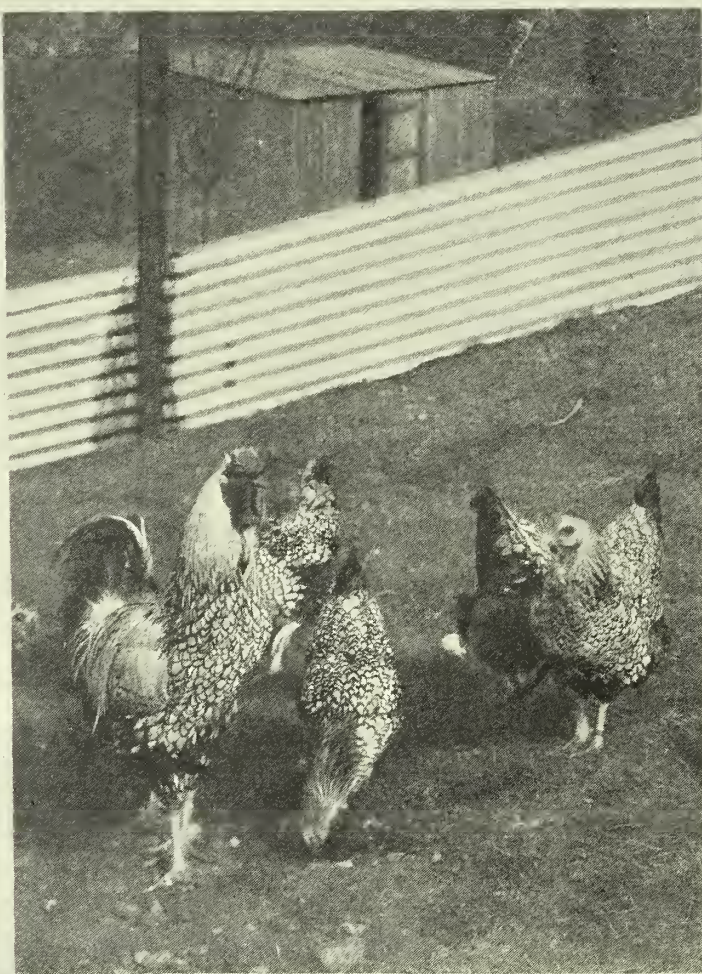
### The Buildings.

The buildings are solid and well-arranged, and the whole farm has an air of prosperity and business that is especially striking. The buildings consist of an incubator house, an exhibition shed capable of accommodating nearly 100 birds and containing Major Barnes' electrical drier in

the centre. This device is capable of drying 14 birds at a time, and while no fumes or bad air are possible, the birds are dried thoroughly and well in a very short time. This was constructed to Major Barnes' plan and under his personal supervision and is a most ingenious and labour-saving method of drying fowls that have been washed for a show. There is also a carpenter's shop, and a large grain store and loft. This has a concrete floor, and here all the chick foods, meal, &c., are kibbled, and mixed, for Major

Barnes supplies his special customers with all kinds of poultry requisites and foods. They can be sure of having the very best quality, free from all impurities. Three machines, a kibbling and grinding mill, a bone-cutter, and a chaff-cutter are constantly at work, run by one electric motor.

On going round the poultry houses one is immediately struck by the perfect arrangements, which ensure plenty of fresh air without draughts, cleanliness, light, warmth, comfort, and convenience. Each includes a sleeping house and scratching shed, the former is bedded with granulated peat-moss litter, the latter with straw chaff six inches deep. The grain is supplied to all the scratch-



**A Breeding Pen of Silver Wyandottes at Stonecroft, Ipswich.**

ing sheds in automatic feeders, which give the fowls plenty of exercise and occupation. Major Barnes believes that prevention is better than cure, and such pests as red mite and vermin have no chance of establishing themselves, as the perches are constantly examined and kept soaked with paraffin.



### The Stock.

On the home farm Major Barnes has several pens of Blue, Black, Buff, White, and Cuckoo Orpingtons. Other breeds include Partridge, Silver, and White Wyandottes, Blue Langshans, and Spangled Old English Game. Here are to be seen birds that have won hundreds of prizes at leading shows.

The Black Orpingtons are of remarkable size, many of them being celebrated winners. The White Orpingtons are of exceptional purity of colour and size. There are eight pens of Blue Orpingtons, amongst them some birds of wonderful colour, shape and size. Major Barnes is a believer in the coming popularity of Blue Orpingtons. Their undoubted utility qualities are combined with perfect type and a most attractive colour. The Cuckoos are well represented; in one pen there are three Crystal Palace 1st Prize winning birds.

Major Barnes also breeds Blue and Buff Orpington Ducks, Indian Runners, and Aylesburies. His Blue Orpington Ducks include the



**An Old English Game Cock. Winner of many prizes.**



**A Black Orpington Cock of great size.  
A celebrated winner.**

1st Dairy winning drake of 1911 and one or two winning ducks. On the separate farms where the ducks are bred, they have unlimited water and in two cases a stream runs through the farm—a veritable paradise for ducks. In addition to the birds kept on the home farm, Major Barnes has a large number of pens on out-lying farms, where the accommodation is practically unlimited. There is rarely more than one breed on each farm, and the effect of a large number of birds of the one variety and colour on one farm is extremely beautiful. The farms extend throughout Suffolk and even into Essex. Major Barnes is a specialist in colour-breeding, and has several very interesting experiments in course of operation at the present time. The results of these experiments he finds are of the greatest value in breeding blue, white, and buff varieties. Major Barnes sends eggs for incubation to all parts of the country and is also an exporter of the best breeding stock.

Visitors to his poultry farm are at all times welcome and there is usually someone available to take them round the various pens and buildings. No poultry lover should pass Ipswich without making a point of seeing this modern and well-conducted poultry farm.



## A REVIEW OF THE CHRISTMAS POULTRY TRADE 1912. SOME STRIKING FEATURES.

TO state that trade at Christmas was good or bad would be a very bold statement for anyone to make, as so much depends on the point of view from which the subject is considered. There are several points which ought to be taken into consideration if a really true estimate is to be arrived at.

The subject should be looked at from a broad point of view. It should be viewed from the standpoint of the producer, the merchant, the retailer, and the consumer. There is yet another point that should not be neglected, that of the rural town and the large centres of population.

When the subject is looked at in this manner the task of deciding whether trade was good or bad becomes a more involved question than it might otherwise appear at first sight.

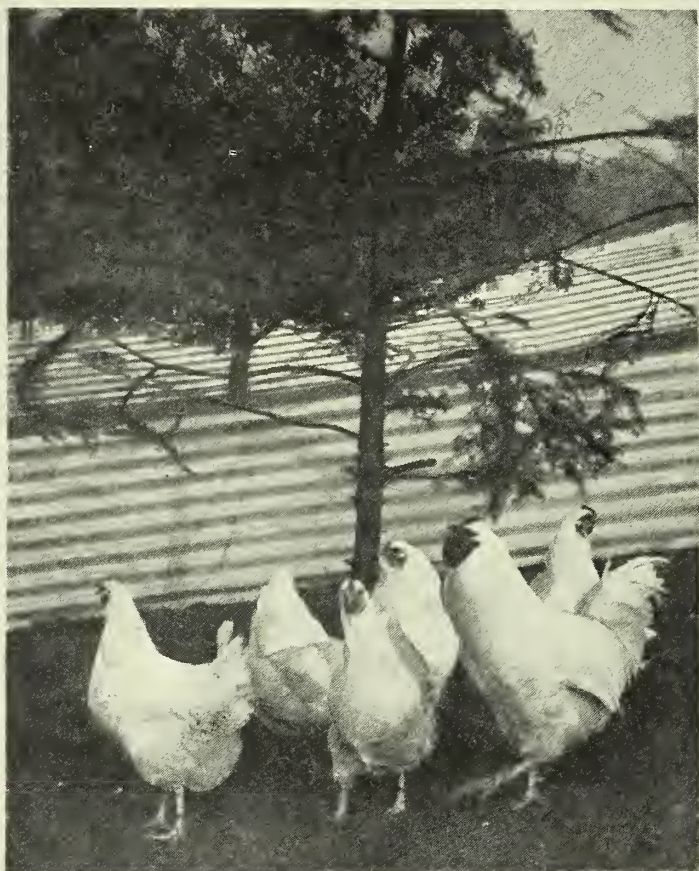
This article, being intended for the producer, to him, naturally, the producer's is the all-important point of view, but I propose to treat the subject on a rather broader basis, as perhaps I may be able to give some useful and guiding information which may be of interest to the readers of this journal.

Broadly speaking, the poultry trade of last Christmas was a disappointment in London, with bright touches here and there. From reports I have received, trade in rural towns was good, but I must confess on this point my information is naturally not quite so full, as I am occupied solely in London and on the Smithfield Markets. In London two powerful factors exercised their influence in a very unpleasant manner. I refer to the bad weather conditions which prevailed both before and after Christmas, and also to the fact that Christmas Day fell this time on a Wednesday.

Wednesday is the worst day that it can fall on for the middle class trader. This fact is well

known to all retailers in large centres of population. To the small retailer Christmas Eve is looked upon as the greatest Saturday of the year. This year there were therefore three Saturdays with only one working day and a half, and the same interval between Boxing Day and the last Saturday. In many cases the money earned on the Monday and Tuesday would not be paid till the end of the week. Those artisans who looked forward to receiving a

monetary Christmas box did not receive their reward till Christmas Eve. On this account large numbers of buyers put off deciding what they would purchase until the last moment. This had a tendency to make the ready money trade slow on the Saturday previous to Christmas, and consequently stocks accumulated. By Christmas Eve retailers found themselves uncomfortably over-stocked and the general public in possession of not as much money as is usual at this period. In a very large number of cases retailers had to sell at a loss. I know of some twenty retailers in a good way of business, men who lost heavily on a large proportion of their turkeys, having to dispose of them



**White Wyandottes belonging to Major Barnes.**

at twenty-five per cent. below cost price. The instances did not occur in one district, but over widely distributed and populous areas of London.

What came to the rescue, and to a certain extent saved the situation of many of the humbler classes, were the slate and Christmas clubs. Slate clubs, however, are not of much benefit to the retailer, and are practically useless to the producer of poultry in this country. The truth is they rather encourage foreign produce of a cheap nature, for it may be taken as a fairly general rule that subscribers expect a lot for their money. The fact is slate clubs are a nightmare to the smaller trader. It is the wholesale merchants that benefit, as the organisers



of Christmas clubs almost invariably purchase from the merchants. The points mentioned above have a much greater effect upon trade at Christmas than is generally supposed. They affect the smaller trader vastly more than they do the larger West End establishments and traders.

One very striking feature of the poultry trade was the falling off this year in the demand for large turkeys. Large birds were most difficult to dispose of, and large sums of money were lost. One dealer assured me that he would think himself lucky if he got out of his large turkeys with a five hundred pound loss. At the time of writing hundreds of large prime birds are lying in cold storage. These will never realise anything near what they cost. Ever since the passing of the Corrupt Practises Act the demand for this class of bird has steadily declined. This decline was more marked this last season than in any preceding year. Medium sized and small birds were in good demand and realised equal, and in some cases better prices per lb. than the large birds.

The stocks of foreign turkeys were not so great as other years and the merchants did well in clearing out almost to a bird. Particularly did this apply to Italian birds. Italy did well, the birds came forward in splendid condition, were well prepared and graded. It was in the preparation and grading that she scored so. Italy has made great strides in the turkey industry. She feeds her birds to perfection, and has them ready to time. Given fair weather conditions, they arrive in remarkably good condition. They are also very good and even in appearance, and therefore tempting to the buyers.

With respect to the chicken trade there was a great shortage of both English and foreign, and prices ruled very high. The same remark applies to ducks and geese.

For fowls, prices ruled higher than they have for many years. I should think that the average price was a record one. Very small chickens, in fact anything with two wings and two legs easily realised four shillings to four and sixpence each. For birds with any quality in them at all six shillings to six and sixpence was readily paid wholesale. Normandy geese also realised their record prices on the average.

To a very large extent the disastrous fire at the Union cold storage plant at Koslop in Russia a few weeks before Christmas, when several thousand cases of poultry were destroyed, was responsible for the shortage. These had all been fattened and prepared for England, but never arrived. It was too late to make good the loss as the stocks destroyed had taken some months to prepare. Some thirty thousand cases had been destroyed. Doubtless many home producers would be glad. Unfortunately it did not occur in time for the home producer to prepare more chickens, ducks, and geese for the market.

If double quantities had been forthcoming prices would not have been appreciably altered and home producers would have reaped a rich harvest.

The poultry trade was on the whole a fairly good one for those producers, who sold early and accepted fair prices; but for those who held their goods, thinking after reading of the great trade "boom" that better prices would be obtainable later, must have been disappointed. There was a general feeling in the air that things were going to hum as the festival drew nearer, and that there would be a big boom. Nearly everyone expected it, but not all realised their expectations.

On Monday, December 23rd, there were very large quantities indeed of large turkeys hanging in the markets. On Tuesday they had disappeared. A very large proportion went into the cold chambers to await their fate for the following Saturday's demand, but, this proved unusually weak. The long week had exhausted the pockets of many of the consumers. It was the weak demand of Saturday the 28th, which hit the retailer the hardest, they could not clear their surplus stock at anything like remunerative prices.

The Dutch Auction which takes place every Christmas Eve at Smithfield and Leadenhall, was well worth a visit, both from the amusement side and bargain side. Good turkeys changed hands at very low prices. These were birds that had arrived too late, being sent for sale on commission, or birds that were throw-outs, and not worth storing. Prices varied from four shillings to ten shillings per bird, according to weight and quality.

All the old tricks of the trade to entice people into buying were resorted to, and to those in the know it was most amusing to watch the moves of the salesmen.

In the early part of the day all the larger birds were offered, and as the hour grew later the birds grew smaller, not because all the large birds were sold, but because the old hand knew that as the hour grew later the buyers got poorer and poorer. He realised that he had to cater for a different class altogether from that to which he was selling earlier and that it was his opportunity to clear off such birds as were not worth cold storage.

Some have said that Christmas 1912 would go down to history as the worst recorded for the small retailer, and only a moderate at best to the retailer. Certainly it was not up to the average, and considerably behind 1911. Wednesday is not a good day for the festival, and luckily it does not fall very often on that day.

When it does occur, I would advise producers, especially if the weather shows signs of being open, to accept any remunerative price offered before the event, rather than risk prices of the last minute.

In conclusion, I should like to say that I had the pleasure of seeing a copy of the Journal of the National Poultry Organisation Society, in which the Editor, Mr. Edward Brown, suggests the extension of the period of consumption of the turkey. It is certainly a good suggestion, and if possible of realisation would do a great deal to prevent a glut of birds at Christmas.



## POULTRY COOKERY.

### TURKEY FOR TWO.

When a large or a medium sized turkey has been served hot, and then cold, the remaining parts can be made use of in many ways and can, very easily, be converted into the most tempting and dainty little dishes imaginable, sufficient for two, or even three people. The name of these dishes is legion, but only a few examples must suffice for the present.

**FILLETS OF TURKEY:** No. 1. Put some good white stock into a stewpan with an onion stuck with half-a-dozen cloves, a bunch of mixed herbs, the thin yellow rind of half a fresh lemon and a little more salt and pepper if necessary. Boil very gently for about half an hour, then strain the liquid off into another stewpan; thicken it to a smooth creamy consistency with white roux, enrich it with a small quantity of thick cream and bring to boiling point. Have ready the remains of the turkey, the meat having been cut into small neat fillets and pleasantly seasoned with salt, pepper and fresh lemon juice and put these into the boiling sauce; boil for one minute—not on any account longer—then draw the stewpan on one side and simmer as gently as possible until the fillets are quite hot through. Dish them up in the centre of a firm potato border which has been brushed over with liquid butter and well browned, and pour the sauce over the fillets only. Garnish the edge of the dish with sprigs of fresh parsley, sprinkle the sauce with a mixture of finely chopped parsley and sifted egg yolk, and serve.

**ANOTHER METHOD:** Cut up the meat as already directed, season it pleasantly and dip the pieces first into beaten egg then into fine bread crumbs and press the coating well in, repeating the process if necessary. When required, fry the turkey in hot clarified fat, or pure beef dripping until coloured a dainty golden brown, then drain very thoroughly so as to ensure crispness, and dish up in neat order on a neatly shaped bed of smoothly mashed and pleasantly seasoned potatoes; garnish round about with a border of skillfully boiled Brussels sprouts, or creamed cabbage, stewed celery, &c., according to taste and convenience and send to table very hot, accompanied—if thought desirable—by some appropriate sauce, or rich brown gravy.

**FRICASSEE OF TURKEY:** Prepare in the usual way a pint of thick, moderately rich bechamel sauce and when this has cooled a little lay in the remains of the bird, which have been neatly cut up and well seasoned in readiness; have ready also half a pound of freshly gathered, carefully prepared button mushrooms and a slice of lean cooked ham cut up either in julienne shreds, or small neat dice, and add these to the turkey; allow the whole to get thoroughly hot without ever reaching boiling point, then dish up in the centre of a hot dish,

round the edge of which has been arranged a border of fine pipe macaroni prepared in the following manner. Boil three or four ounces of macaroni in plenty of well flavoured stock, or water until tender, but not at all broken or pulpy, then drain thoroughly and cut it in half inch lengths; return these to the stewpan with an ounce of fresh butter, a seasoning of salt and pepper, a tablespoon of fresh lemon juice and a large tablespoon of finely chopped parsley, and toss over the fire until the macaroni is bubbling hot and nicely coated when it is ready for use.

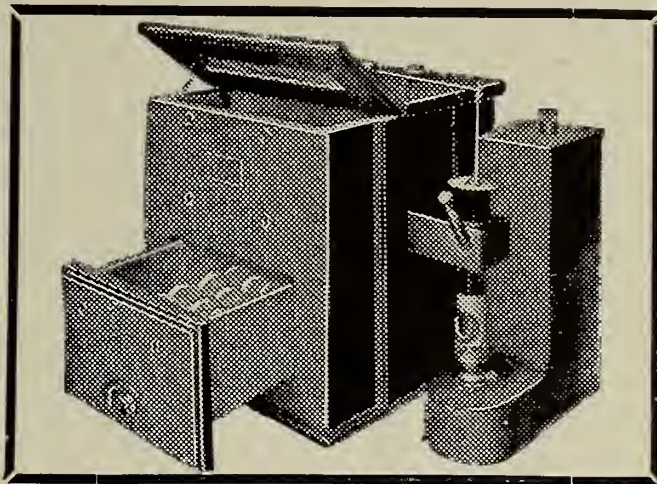
**POTTED TURKEY:** Cut off all the flesh that remains and free it carefully from all skin, gristle, etc., then weigh it, mince it just roughly and put it into a mortar with half its weight in lean boiled ham and quarter its weight in fresh butter; add appropriate seasonings in rather liberal quantities, and pound the whole to a perfectly smooth paste; press this firmly into small pots or jars, cover with a layer of clarified butter a quarter of an inch thick and then with strong white paper, and store in a cool dry place until required.

**MINCED TURKEY:** Even the very smallest scraps can be used for mincing so that the dish is an exceedingly economical one, and when carefully prepared, one that is always very highly appreciated. Gather together all the meat that remains and after carefully rejecting every particle of skin and gristle, chop it either finely or roughly according to taste, and season it pleasantly with salt, pepper, mace and fresh lemon juice. When thus prepared put the mince into a stewpan with sufficient good white sauce to thoroughly moisten it without making it at all sloppy; allow the preparation to heat very gradually and when quite hot, turn it carefully into the centre of a well-mashed and seasoned potato border. Make the top flat and cover it with skilfully poached, neatly trimmed eggs, then sprinkle these lightly with finely chopped hot parsley, arrange sprigs of fresh parsley round about, and serve.

**TURKEY CARCASE:** This is an exceedingly useful item not by any means to be dispised or thrown away. Break it up small and put it with any odds and ends of meat that remain into a large stewpan; add a good supply of flavouring vegetables cut into small pieces, a bunch of savoury herbs, a seasoning of salt and pepper, and sufficient cold water to cover the whole. Bring slowly to the boil, then skim very carefully and boil gently for three or four hours. Repeat the skimming process frequently and add more water when necessary, then when all the good has been extracted from the various items, strain the stock carefully into a large bowl and when quite cold remove every morsel of fat which may have settled on the surface. The stock is then ready for use, and every good cook knows what a very valuable item it is to have at hand for the making of soups, sauces, ragouts, and many other dishes which need not be mentioned.



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*The Largest Poultry Appliance Manufacturer in the World.*



# TABLE OF PRICES REALISED FOR HOME, COLONIAL, AND FOREIGN POULTRY, GAME, AND EGGS FOR THE FOUR WEEKS ENDING JANUARY 18, 1913.

## ENGLISH POULTRY—LONDON MARKETS.

DESCRIPTION.	1st Week.		2nd Week.		3rd Week.		4th Week.	
	Each.		Each.		Each.		Each.	
Surrey Chickens ..	3/6	to 4/6	3/6	to 4/6	3/6	to 4/6	3/6	to 4/6
Sussex ..	3/6	to 4/6	3/6	to 4/6	3/6	to 4/6	3/6	to 4/6
Boston ..	3/0	to 4/0	3/0	to 4/0	3/0	to 4/0	2/9	to 4/0
Essex ..	3/0	to 4/0	3/0	to 4/0	3/0	to 4/0	3/0	to 4/6
Capons ..	5/0	to 6/0	5/0	to 6/0	5/0	to 6/0	5/0	to 6/0
Irish Chickens ..	2/3	to 3/3	2/3	to 3/3	2/3	to 3/3	2/6	to 3/6
Live Hens ..	2/3	to 3/0	2/3	to 2/9	2/3	to 2/9	2/6	to 3/3
Ducks ..	3/6	to 4/6	3/6	to 4/6	3/6	to 4/6	3/6	to 4/6
Goslings .....per lb.	6	to 7	8	to 9	8	to 9	8	to 9
Turkeys, Cocks "	7	to 9	7	to 9	8	to 11	8	to 10
" Hens "	8	to 9	8	to 9	8	to 10	8	to 10

## ENGLISH GAME—LONDON MARKETS.

DESCRIPTION.	Each.		Each.		Each.		Each.	
	Each.		Each.		Each.		Each.	
Grouse (Brace) ..	2/3	to 2/9	2/0	to 2/6	2/0	to 2/6	2/0	to 2/6
Partridges.....	2/6	to 3/0	2/6	to 3/0	2/3	to 2/9	2/6	to 3/0
Pheasants.....	3/0	to 3/6	2/6	to 3/6	2/6	to 3/0	2/6	to 3/0
Black Game.....	1/3	to 2/3	1/3	to 2/3	1/3	to 2/3	1/3	to 2/3
Hares.....	8	to 11	9	to 11	9	to 11	9	to 11
Rabbits, Tame.....	—	—	—	—	—	—	—	—
" Wild ..	—	—	—	—	—	—	—	—
Pigeons, Tame.....	2/3	to 2/9	2/3	to 3/0	2/6	to 3/0	2/6	to 3/0
" Wild ..	2/0	to 3/0	2/0	to 3/0	2/0	to 3/0	2/0	to 3/0
Woodcock ..	9	to 1/6	9	to 1/6	9	to 1/6	9	to 1/6
Snipe ..	8	to 1/0	8	to 1/0	8	to 1/0	8	to 1/2
Plover ..	—	—	—	—	—	—	—	—

## ENGLISH EGGS (Guaranteed New-Laid).

MARKETS.	Per 120.		Per 120.		Per 120.		Per 120.	
	Eggs per dozen.		Eggs per dozen.		Eggs per dozen.		Eggs per dozen.	
LONDON ..	17/-	to 18/-	13/-	to 15/-	12/6	to 13/6	12/6	to 13/6
Provinces.....	2/0	to 1/9	2/0	to 1/9	1/10	to 1/9	1/6	to 1/9
CARLISLE ..	2/0	to 1/9	2/0	to 1/9	1/10	to 1/9	1/6	to 1/9
BRISTOL.....	1/9	to 1/8	1/9	to 1/8	1/9	to 1/8	1/9	to 1/8

## FOREIGN POULTRY—LONDON MARKETS.

COUNTRIES OF ORIGIN.	PRICES REALIZED DURING THE MONTH.			
	CHICKENS. Each.	DUCKS. Each.	DUCKINGS. Each.	GEESE. Per lb.
Russia ..	—	—	—	—
Belgium ..	—	—	—	—
France.....	—	—	—	—
United States of America ..	—	—	—	—
Austria ..	—	—	—	—
Canada ..	—	—	—	—
Australia.....	—	—	—	—

## IMPORTS OF POULTRY AND GAME. MONTH ENDING DEC. 31ST, 1912.

FOREIGN GAME. LONDON MARKETS.	Price Each During Month.	COUNTRIES OF ORIGIN.		DECLARED VALUES.
		Poultry.	Game.	
Capercailzie ..	—	—	—	—
Black Game ..	—	—	—	—
Ptarmigan ..	—	—	—	—
Partridges ..	—	—	—	—
Quail ..	—	—	—	—
Bordeaux Pigeons ..	10 to 1/4	—	—	—
Hares ..	—	—	—	—
Rabbits ..	—	—	—	—
Snipe ..	—	—	—	—
Totals.....	—	£308,434	£4,873	—

## IRISH EGGS.

DESCRIPTION.	1st Week.	2nd Week.	3rd Week.	4th Week.
	Per 120.	Per 120.	Per 120.	Per 120.
Irish Eggs.....	13/0 to 14/0	13/0 to 14/0	12/6 to 13/6	12/6 to 13/6

## FOREIGN EGGS.

DESCRIPTION.	1st Week.	2nd Week.	3rd Week.	4th Week.
	Per 120.	Per 120.	Per 120.	Per 120.
French ..	13/0 to 14/0	13/0 to 14/0	12/6 to 13/6	12/6 to 13/6
Danish ..	12/6 to 14/0	12/6 to 14/0	12/6 to 13/6	12/6 to 13/6
Italian ..	12/3 to 14/0	12/3 to 14/0	11/9 to 13/0	11/9 to 13/0
Austrian ..	9/3 to 12/3	9/3 to 12/3	9/3 to 11/6	9/3 to 11/6
Russian.....	9/3 to 11/6	9/3 to 11/6	9/3 to 10/6	9/3 to 10/6

## IMPORTS OF EGGS. MONTH ENDING DEC. 31, 1912.

COUNTRIES OF ORIGIN.	Quantities in Gt. Hund.	Declared Values.
Russia.....	971,680	£473,195
Denmark ..	415,918	£268,535
Germany ..	60,012	£25,633
Netherlands ..	35,932	£19,430
France ..	26,819	£15,055
Italy.....	43,870	£25,665
Aust.-Hungary	48,174	£22,436
Other countries	254,061	£103,375
Totals .....	1,856,376	£953,324



## S. G. HANSON'S

### Standard White Leghorns.

*BRED TO LAY.*  
*Noted for Constitution-  
 al Vigour, Stamina,  
 Size of Eggs, and  
 Prolificacy.*

Breeding Hens, two years old, mated to  
 Cockerels. PULLETS NOT USED AS BREEDERS.

*All Stock  
 and Eggs  
 sold, only  
 from the  
 Farm.*

Breeders of the flock of 402 pul-  
 lets which laid in

January	...	...	7616
February	...	...	7310
March	...	...	8606

WORLD'S RECORD 23532

Eggs for Hatching from March to May 5/-  
 per dozen; 35/- per hundred; £15 per 1,000;  
 Cockerels 10/6 and 21/- each.

THE OLD DOWN, BASINGSTOKE.

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FOR

## POULTRY KEEPERS.

BY

C. E. J. WALKEY,

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 Instructor in Poultry Keeping  
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Table Points and  
 Turkeys that come  
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Unrelated Birds  
 for Mating, Show-  
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 Farm,

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Exporter and the Largest Breeder of High-  
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35 years' practical experience, during which time Prizes,  
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PRICE LIST AND TESTIMONIALS ON APPLICATION.

Over 200 Turkey  
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 Chicks and Eggs  
 in Season . . .

## England's Famous Stud.

### WHITE ORPINGTONS.

Has won more honours at the Dairy, Palace, and  
 Club Shows, 1908-1911, than any other stud, and more 1sts  
 and Specials in open classes at these events in 1911 than all  
 other studs together; also leading honours America and  
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 Winners supplied to breeders all over the world. Show  
 Birds a Speciality.

Has a Short Leg and deep, low, wide, massive body and  
 neat head the judge of to-day demands, together with great  
 purity of Whiteness.

Utility Birds from £0 7 6; Utility Breeding Pens from  
 £3 10 0; Exhibition Birds from £1 1 0; Exhibition  
 Breeding Pens from £5 5 0

Prolific Layers and splendid table qualities. A profit-  
 earning bird with a splendid demand at the best prices.

MISS CAREY, Toynton, Spilsby.

Buff and White Orpingtons and Faverolles bred.  
 Pupils received.

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BENNETT'S FAMOUS S.C. RHODE ISLAND REDS

AND

BARRED PLYMOUTH ROCKS

ARE RAISED

F. A. Bennett, S.C. Rhode Island Reds.

Wm. Z. Bennett, Barred Plymouth Rocks.

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Write for Prices and Record of Stock.

YARDS NEAR VAN WINKLE LAKE, CANTON, ILL., U.S.A.

When answering advertisements please mention  
 the "Illustrated Poultry Record." It will help  
 you and it will help us



## FRENCH VIEWS ON PROMOTION OF LAYING.

A Swiss writer has recently been giving his views on the promotion of laying in summer and winter, that is, from August to January, which is as follows:

In order to maintain the summer output of eggs, the hens must be given a plentiful supply of green food: cabbages, lettuces, spinach, and chicory are all good, but sorrel is the best of all. Each hen should be given daily a good handful until the first cold sets in, when the amount of green food must be lessened in order to avoid cooling the fowls too much.

Then, to encourage moulting and hasten the winter laying season, a good deal of meat must be given, but overheating and diarrhoea should be guarded against.

After the middle of September, all the hens of two years old and over, which are no longer strong enough to produce the usual quantity of winter eggs, should be got rid of. Pullets are necessary for a succession of eggs in autumn and winter; these should be hatched in April, or bought on the market in June. If well fed and housed, they will certainly lay just when the other fowls leave off producing eggs. According to the writer, the breed is of little consequence; one poultry keeper will have remarkable results from a breed which is a failure in other hands. Without denying the winter laying qualities of Faverolles, Orpingtons, and Coucous de Malines, the writer believes that the chief point is selection. The poultry keeper who for several consecutive years only sets the eggs of his best fowls will not fail to greatly improve his stock.

As an instance of this, the writer cites the case of five Buff Orpington pullets six months old, A, B, C, D, E, which gave the following number of eggs from November 1911 to May 1912.

Month.	A	B	C	D	E	Total
Nov., 1911 ...	18	17	—	—	—	35
Dec. „ ...	24	16	25	18	—	83
Jan., 1912 ...	24	(broody)	27	13	14	78
Feb. „ ...	15	11	24	25	27	102
March „ ...	(broody) 1	29	20	5 (broody)	22	77
April „ ...	24	2	25	8	5	64
May „ ...	12	5	(broody)	21	23	61
Eggs laid from Nov. to Jan.	66	33 + broody	52	31	14	196
Eggs laid from Nov. to May	118	80	121	90	91	500

Summarizing, the writer concludes:

1.—In order to get eggs in summer (apart from food, and the diet should be varied) it is necessary to destroy the vermin and give the fowls much green food and plenty of shade.

2.—To obtain eggs in winter it is necessary to weed out all two-year old fowls, to house the birds well, and to obtain in good time a choice of pullets, about 50 per cent. of the stock; and in every case careful selection is needed.

3.—The course of life in the poultry-yard in winter should be as even as possible; any emotion, change of habits, introduction of strange birds into the run, may disturb the laying of the fowls.

## ARTIFICIAL HATCHING & REARING.

*To the Editor of the ILLUSTRATED POULTRY RECORD.*

SIR,—One of the most difficult problems we shall have to contend with in the near future is hatching and rearing poultry by artificial means. It must have come very forcibly to the knowledge of many large breeders of poultry throughout the country that rearing and hatching chickens by the above method is not nearly so easy a task as it was when the process was first introduced. The continual inbreeding year by year from birds that have been artificially hatched and reared has caused in thousand of cases chickens to hatch out delicate and very difficult to rear to maturity. I feel and think the main cause has been by many not taking sufficient care during the period of hatching and afterwards.

During incubation, and in brooders at different periods, the temperature has been too high and at other times too low. The former is the most serious as the birds will be hatched with affected livers, and though many may survive and are put into the breeding stock, they will be certain to produce delicate chickens; and this state of affairs continues year by year, birds being sold and distributed into different yards. It also has great effect on the fertility of the eggs. Nothing is so serious as a temperature rising and falling during incubation or afterwards in the brooders, and the health of the birds is seriously affected in many ways. Hot air incubation is more dangerous than that with water tanks, and requires more attention.

I am sure there are a great number of old breeders who will agree with me that although a great many more chickens are hatched annually, the greater majority are not so healthy as those by the old mode of hatching under hens, neither do we obtain such good results, and the same applies to the fertility of the eggs. I fully realize the fact that there are a very great number of poultrymen in England who are experts in the art of hatching by artificial means and can produce birds strong and healthy, but as time goes by these birds may be mated up with others which have been badly hatched and thus cause weakness throughout the stock. My own firm opinion is that twenty years hence we shall find it very difficult to rear chickens by artificial means.



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IN THE BREEDING PEN  
AND FOR  
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In tins, post free, 1/6, 2/6, 4/6.  
Larger quantities much cheaper.

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A Poultry Plant that doesn't pay is a hobby.

A Poultry Plant that does pay is a business.

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## MODERN BUSINESS POULTRY PLANT

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## PROFIT TO THE BUYER.

*Just Common Sense and our S. C. White Leghorns  
The Greatest Combination for profit ever Known.*

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Five years Dairy Show Champion; Nine years Palace Champion. The best of its kind produced. A truly marvellous and thoroughly consistent hatcher.



##### DRAWER TYPE.

30-Egg size..	2	14	0
60-,,	3	7	6
100-,,	4	0	0
200-,,	6	17	6

##### PANEL TYPE.

30-Egg size..	2	18	0
60-,,	3	12	6
100-,,	4	5	0
200-,,	7	5	0

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Telegraphic Address—"INCUBATOR, HARBORNE."



Our one and only remedy will be to hatch as many as we can under hens, so that we always have a certain number of hen-hatched stock for our breeding pens.

I always have tried, if possible, to buy stock birds hatched under hens, and have proved the great benefit. I have, in the last two years, purchased eggs in large quantities early in the season from different breeders, and have found a great deal of weakness in the chicks, and also have heard from time to time of great losses in different big yards during the breeding season. I am confident that my theory is a sound one and shall be very interested to hear the opinion of other breeders on the subject. I may say that I have this year hatched a great number by artificial means, and have had good results; but I find to obtain these results great care must be taken during the period of incubation and afterwards, a great percentage of losses means that small profits may be turned into heavy losses. I am now living in a very healthy neighbourhood, most beneficial to the rearing and breeding of chickens, as the land is suitable, a dry chalky soil, and being 800 feet above the sea level, the atmosphere is clear and healthy. There are rarely any cases of gapes or roup in chickens. The old inhabitants who have lived on Bledlow Ridge have told me that they have always had great success with their fowls. Broods of 14 or 15 chicks run about with the hen, growing rapidly, and there is no disease.

I am sure that my remarks will apply perhaps even more forcibly to duck breeding. In this district a great number of ducks are kept, but all hatched under hens, and there are often hatches of 17 to 18. In most instances the stock ducks have no water to swim in but the eggs are most fertile. The very great difference seen in the growth of chicks hatched under hens and bred from stock that have perhaps for generations never seen an incubator, is wonderful; and the loss sustained is very small.

I always found years ago I had splendid success when hatching with hens. Take for instance the present season, the scarcity of chickens is great, the birds weighing 3lbs. are making 4/- to 4/6 each. I was talking to a very large buyer a few days ago, and he told me he never knew early chickens so scarce. Very often where large stocks are kept it is never known to the owner how great the mortality has been with his chickens, all he knows is what number has been reared; but what may have been the cost to do it he cannot tell till his profit and loss account is made up.

Some readers of this letter may think I am exaggerating, but I am afraid ere long they will find what I have stated in the above, will take place. The great thing is to prevent it. I am a great believer and supporter of artificial hatching and rearing, but I think great improvement is required and not so much intense heat. Quite as much harm sometimes is done in brooders as in incubators.—Yours, etc.

The Firs, Bledlow Ridge, P. A. FARRER.  
Wallingford, Bucks.

## THE UTILITY POULTRY CLUB.

The Utility Poultry Club's Year Book and Register of Breeds for 1913 has now been issued from the publishing office of the Club, 68b, Lincoln's Inn Fields, London, W.C.

The Book comprises, with the advertisements, over 200 pages, and to those interested in poultry keeping should prove valuable. Among other features it contains useful notes on the proper management of poultry for each month of the year; tables showing the monthly and relative prices of eggs; the foreign imports of eggs and poultry; a list of the Poultry Clubs; and full accounts of the various laying competitions that have been held in this country, including the present twelve months' competition. In this connexion it is interesting to note that £500 has been granted from the Development Fund for this competition, thus giving official recognition of the value of the work done by the club.

These competitions have demonstrated that good laying is a question of strain, and we observe that the register contains particulars of over 1,000 pens of poultry with details of strain and various other information to assist breeders.

A perusal of the Annual Report of the club will abundantly show its manifold activities, and the many privileges enjoyed by its members, and as a free copy of this book is one of these privileges we are not surprised that the club numbers over 1300 members and we think this number should be largely increased in the future.

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## THE TABLE POULTRY CLUB YEAR BOOK.

In 1912 the Table Poultry Club was formed, and its first Year Book has now been published. Although only established at a meeting held late in July last, the club already numbers one hundred members. As its name implies, the club is founded for the purpose of breeding the ideal table fowl, and for the purpose of discussing the best and cheapest methods of hatching, feeding, raising and fattening.

The Year Book, which has now been published, is a very good production. There are some excellent illustrations of table poultry, both alive and dead. Articles by W. Hemphrey, C. A. Falkenstein, S. C. Sharpe, and Mrs. G. O'Grady, include, "Fattening and Marketing Table Poultry," "The Production of Chicks for Table Purposes," "The Sussex as a Table Fowl," and "The Table Poultry Industry in Ireland."

The book also contains full particulars of the membership and an account of the general meeting together with the balance sheet presented at the end of the year. It is issued free to members of the club, but non-members can have a copy, post free, for 6d., by applying to Mr. W. Hemphrey, the Honorary Secretary of the Table Poultry Club, The Dower House, Langley Park, Beckenham.



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Two brooders at cost of one.

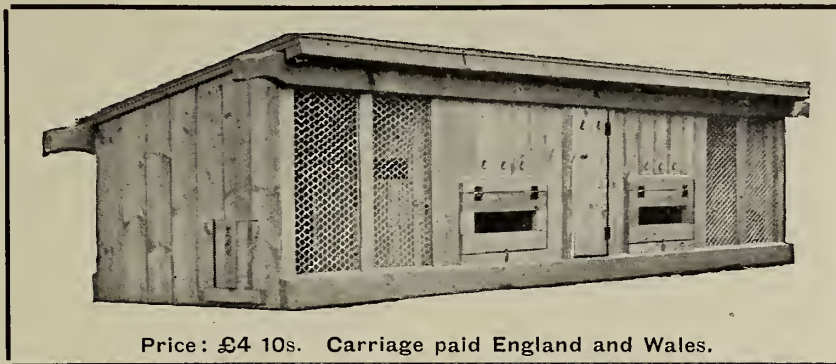
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- from Mr. C. Sandell, Jolesfield, Partridge Green. The Brooder you supplied me with has worked very well. I have not had the least trouble with it in any way.
- from Mr. C. T. Edwardes, Riverside, Needham Market. Would you please send to arrive by Thursday, 22nd inst., one Morland Double Brooder. The last one I had from you was most satisfactory.
- from Mr. S. C. Sharpe, Hon. Sec. Sussex Poultry Club, Ringmer, Lewes. Pleased to say Brooder is very satisfactory.
- from Mr. R. Tellam Hocking, Tregawne, Withiel. We received the Foster-Mother which I like very much.
- from Mr. F. H. Wheeler, Bridge House, Marden. I am very pleased to inform you that so far I have had excellent results from your Brooders, can you send me one at once for delivery by Thursday next.

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BIRMINGHAM.**



## THE COTTON THISTLE FOR POULTRY.

Mr. J. N. Crouchmans of Ulting, Malton, Essex, writing in the *Daily Citizen*, has some interesting things to say regarding the cotton thistle as a cheap poultry food. While farmers are puzzling their brains, he writes, "as how to make ends meet it never seems to enter their heads that it might pay them well to grow thistles.

"The birds of the air revel in the food obtained from the thistle, and will go miles on the wing to find it. What is good enough for birds ought to be as palatable for fowls and pigs. There are many sorts of thistles; the seeds of some sorts are too small for fowls, but the finches and the linnets will find them, and this fact the bird-catchers are well acquainted with.

"Now the kind of thistle I wish to direct public attention to is the sort called the "cotton thistle." This year two of these thistles grew in my garden. Their great branches extended, and the plants grew to the height of seven feet and a few inches. What splendid flowers they bore! As the seed began to ripen I clipped the seed heads from the plants and laid them in the sun. When hardened, the seed was easily cleared of chaff, etc., by the wind.

"Having collected and cleared my seed from all rubbish, I measured it, and to my astonishment found that the produce from the two "cotton thistles" amounted to two and a quarter pints of seed, turning the scale at one pound seven and a half ounces.

"With its broad and long leaves, towering stems, and sharp thorns, what a hedge of defence, and yet a picture of rural beauty, the "cotton thistle" represents even in a cottage garden. The seeds of the plant are about the size of rice, and very much like it in form.

"Not wanting so much as I have in stock, I will forward a small quantity for distributive purposes on receipt of a stamped addressed envelope from any reader of this letter. An enclosed halfpenny stamp just to pay for trouble of packing and posting may be sent, but it is optional for the reader to enclose it or otherwise."

## EGYPT'S EGG EXPORTS.

According to the *Bulletin de la Chambre de Commerce Francaise*, of Alexandria, the export of Egyptian eggs is at present as active as ever, the value of this trade representing 3,000,000 frs. per annum.

The eggs, which are small, are mainly provided by the breed of poultry known as Bedouines.

As a rule, the export commences towards the end of October, and lasts to the end of April, when the rise in temperature no longer permits the preservation of eggs on a long journey.

The trade in eggs undergoes the same vicissitudes as land crops. Thus, from 1906 to 1907 there was a great falling off, caused by cholera amongst the fowls, the export dropping down to 35,000 cases per annum. Since then the trade has developed

considerably, as will be seen from the following figures:—

1908-1909	...	...	54,000 cases of 12 doz.
1909-1910	...	...	58,000 " "
1910-1911	...	...	60,000 " "
1911-1912	...	...	98,600 " "

The present season seems normal, and promises not to be inferior to the preceding one.

The exports are effected via Alexandria, the few houses which existed at Cairo having transferred their offices to the port, owing to the facilities offered for shipment.

The Egyptian production is divided into three categories, viz.:—

Upper Egypt with 75 per cent. of production.			
Lower Egypt	"	15	" "
Fayoum	"	10	" "

England is the principal client for Egyptian eggs. Very few are sent to London, the greater part being forwarded to the industrial centres, where they find a ready sale amongst the working classes owing to their cheapness.

France comes next, and Austria and Germany occupy the third and fourth rank.

## Artificial Eggs.

We are again threatened, this time by a Russian chemist, Dr. Paul Walden, with artificial eggs that shall rival the regular hen fruit. "Threatened men live long." We have heard that story before.

## QUARTERLY EXCURSION PROGRAMME.

The Great Central Company's Programme of Excursion facilities from London (Marylebone) contains in concise form a vast amount of useful information for those who wish to take advantage of the cheap travel facilities to the Midlands, Yorkshire, Lancashire, and North of England during the months of January, February and March. On alternative Saturdays tickets at low fares are issued to numerous stations available in many cases by express trains, the compartments of which are well lighted and maintained at a genial temperature.

Those who wish to spend a day or half day in the country will find low fares are charged several days a week to the Chiltern Hills and Vale of Aylesbury. Week-end and Tourist tickets can also be obtained to a large number of places. In each case the train times for both the outward and homeward journeys are given, with the fares, and the periods for which they are available opposite each particular station, thus enabling the traveller to obtain the desired information at a glance. Copies of this excellent programme can be had free at Marylebone Station, G.C.R. Town Offices, or post free from Publicity Office, 216, Marylebone Road, N.W.



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Their improved lamp is also of importance. It holds sufficient oil for the whole hatch. It is fitted with a patent slide, to which a burner is attached, which enables one to withdraw it without removing the reservoir, to a convenient position towards the front of the incubator. By using this lamp the flame can never go out, and all danger of oil over-heating is entirely avoided. The lamp is supplied with all Gloucester Incubators free of additional cost. The Gloucester patent automatic door-closing apparatus is an ingenious appliance, which enables the operator to close automatically the door of the incubator after the cooling period.

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The following is a list of W. Tamlin's exports for December, 1912: five 30-egg incubators, ten 60-egg incubators, fifteen 100-egg incubators, twelve 200-egg incubators, two 300-egg incubators, thirty 100 Foster Mothers, to Mons. Andre Masson, sole agent for France; ten 50-egg incubators, fifteen 100-egg incubators, five 60 Sunbeam rearers, two 100 Sunbeam rearers, one 60 Foster Mother, two 100 Foster Mothers, to Messrs. Chandler, Agents for Melbourne, Australia; one 100-egg incubator and one 100 Foster Mother, to Ponta Delgada, order of Knowles and Foster; one 100-egg incubator, to Singapore, order of Messrs. F. & S. Dudgeon; one 30-egg incubator and one 60 Foster Mother, to Miss Ratcliffe, Natal, South Africa; one 100-egg incubator, to F. S. Dowell, Brazil, S. America; one 60-egg incubator, to Capt. MacNeil, West Coast of Africa; three 60-egg incubators, six 100-egg incubators, six 60 Foster Mothers, to A. F. Phillips & Co., sole agents for Bulawayo; one 100-egg incubator and one 100 Foster Mother, to A. B. Craven Esq., Italy.

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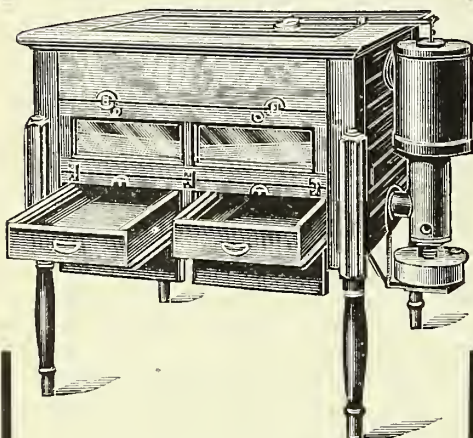
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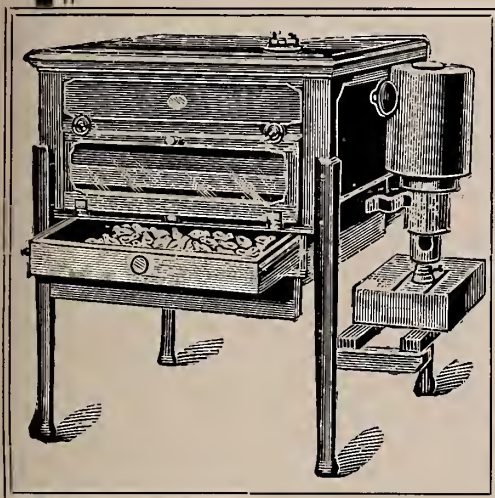
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**WHITE WYANDOTTES**  
**PARTRIDGE WYANDOTTES**  
**RHODE ISLAND REDS**  
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of Challenge Cup Strains, 21/- per doz. From Prize Strains, which combine also good Laying qualities, 10/6 per doz. From Pure Birds of their special Laying strains (with the exception of Black Orpingtons) 6/6 per doz.

### BLUE ORPINGTONS.

They possess the largest stock of this beautiful breed in England, and have won more Challenge Cups, Trophies, Gold Medals, and Prizes with these during present season than all the other breeders put together, and can now supply eggs from:—

Pen No. 1, containing Cockerel, Challenge Cup and 1st at International at Crystal Palace 1912—mated with Hen, winner of Challenge Cup and 1st at Crystal Palace, 1912 (only time shown); Hen, winner of Cup and 1st Crystal Palace, 1911 (only time exhibited), and two grand Hens which bred their Dairy winners. £3 3s. per doz.

No. 2, containing Cock 2nd at Crystal Palace, 1912 (only time shown)—mated with Pullet, winner of Challenge Cup for best Blue Pullet and 1st at Grand International, Crystal Palace, 1902, also International Trophy for the best Orpington in the Show (excepting Buffs), beating all the Blacks and Whites exhibited at the biggest Show of the year, and Gold Medal for the best bird in the Club Show; Pullet, 2nd at same Show (both birds only times exhibited and admitted to be the two best Blue Orpington Pullets living) together with two equally good but unshown Pullets. £3 3s. doz.

No. 3, containing Cock, 1st Haywards Heath, 1911 (only time exhibited)—mated with five Pullets bred from the same pen which produced the Palace winning hen of this year. £2 2s. per doz.

No. 4, containing Cockerel, 2nd at Crystal Palace and 2nd at Dairy, 1912 (under different judges—and only times exhibited)—mated with Hen, 4th Dairy, 1912, as a Pullet; and Pullet, 2nd Dairy, 1912 (in moult at time of Palace Show and laying again now); Pullet, 3rd Haywards Heath, 1912, and two excellent Hens. £2 2s. per doz.

No. 5, containing Cockerel, 3rd Dairy, 1912, mated with five excellent unshown Hens. £1 1s. per doz.

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For the last two copies of their monthly journal, which is the premier utility paper of the United Kingdom, and the original monthly (published for the last 27 years), kindly write to the GENUINE HOME OF ALL THE ORPINGTONS:—

 **ORPINGTON HOUSE, ST. MARY CRAY, KENT.**  
TELEPHONE—7 CRAY.

Will readers be good enough to carefully note above address carefully and not send their letters to Orpington, as many think this is still their address, but it has not been for over 20 years, when they moved from Orpington to St. Mary Cray—after naming their fowls Orpingtons, in compliment to the village where they had lived; also to avoid mistakes, note that they are not a Limited Liability Compny.